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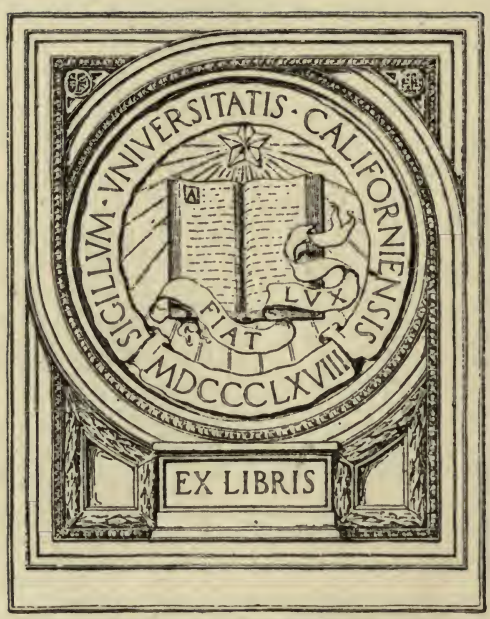
MUNITION MAKERS

HEWES AND WALTER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WOMEN AS MUNITION MAKERS

A STUDY OF CONDITIONS IN BRIDGEPORT, CONNECTICUT

BY AMY HEWES

MUNITION WORKERS IN ENGLAND AND FRANCE

A SUMMARY OF REPORTS ISSUED BY THE BRITISH MINISTRY OF MUNITIONS

BY HENRIETTE R. WALTER

INVESTIGATOR DIVISION OF INDUSTRIAL STUDIES
RUSSELL SAGE FOUNDATION

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• Worker living with family
° Worker living alone
1 Plant of Union Metallic Cartridge Company
2 Plant of Remington Arms Company

MAP OF BRIDGEPORT, SHOWING LOCATION OF HOMES OF WOMEN INTERVIEWED

WOMEN AS MUNITION MAKERS

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BY AMY HEWES

UNIV. OF CALIFORNIA

INTRODUCTION

WHY AND HOW THE INVESTIGATION WAS MADE

DURING the early months of 1915 the world of industry was stirred by rumors of unheard of rewards for work in munition shops in the United States. Women, it was said, were in as great demand as men and other occupations were suffering from the competition of high wages paid for work on war materials. The first commercial depression following the outbreak of the war in Europe had passed and the business of supplying materials of all kinds to the warring countries had begun.

With this harvest of war orders had come in several localities a rapid increase in population, pressing municipal problems, and the dangers of overstrain in industry itself through the intense effort to secure maximum output. What effect would this sudden expansion of a war trade have upon women workers? Could they stand the race for speed? Overtime, night work, and Sunday work might be insisted upon as in England. Would our labor laws prevent overstrain?

Throughout the east munition companies had constructed huge plants and begun manufacturing on an enormous scale before 1915 was half over. At Eddystone, Pennsylvania, two large factories were built, each with about 15 acres of floor

space;* one, a branch of a company whose contracts from the Allies were said to amount to almost $200,000,000, manufactured shrapnel; the other, a branch of the largest munition factory in Bridgeport, had a capacity of 1,500,000 rifles a year. In Delaware and Pennsylvania another huge company had been operating great plants to fill orders running into the millions of dollars. Within ten months during 1915 and 1916 this company declared dividends amounting to 104 per cent on its common stock. The middle west had also had its share in the munition business; the great steel companies had been turning out order after order, with others on hand and deliveries running more than a year ahead. The record of war material sent out of the port of New York in one week in August, 1916, included $20,000,000 worth of explosives, $10,000,000 worth of shells and shell materials, and nearly $1,000,000 worth of fire-arms.

To this large production, the city of Bridgeport, Connecticut, was an important contributor, and here women were employed in large numbers in munition making. For the women and girls in this New England town, as well as for those in other such centers, obvious dangers were ahead. The necessity to recruit new workers had already drawn into the industry Bridgeport women un-

* On April 10, 1917, an explosion completely destroyed the loading and inspecting buildings of the Eddystone Ammunition Company at Eddystone, Pa., resulting in the death of 122 workers, more than half of whom were women, and the serious injury of over 50 more.

accustomed to factory work, and had brought girls from other places, setting them adrift without homes in a community quite unprepared to protect their health, give them wholesome recreation, sufficient transit facilities or even proper housing.

In the autumn of 1915 the Department of Surveys and Exhibits of the Russell Sage Foundation, in co-operation with *The Survey* magazine, had sent Mr. Zenas L. Potter to Bridgeport to make a brief study of the social effects of the war boom. His report was published in *The Survey* in December.* It indicated the need for further observation, especially for a study of the women who were making munitions. In the summer of 1916 the Foundation, through its Division of Industrial Studies, undertook, therefore, a brief investigation of the women employed in the largest munition plant in Bridgeport, the cartridge shops of the Remington Arms-Union Metallic Cartridge Company,† for the purpose of discovering the effect upon them of the changed living and working

* Potter, Zenas L.: War Boom Towns, Bridgeport. *The Survey*, pp. 237-242, December 4, 1915.

† This company, the union of two firms that have long been famous in the manufacture of firearms and shells, employed at the time of the investigation 8,000 men and 4,000 women in the cartridge shops. Information is lacking as to the number of men in the rifle factory. Towards the close of the year 1916, the company began the experiment of employing women in the plant of the Remington Arms, where rifles are manufactured, but this was subsequent to the investigation, so that the work of these women is not included in the inquiry. Of four other Bridgeport munition firms, two employed no women, and two a relatively small number.

conditions.* Such an inquiry, it was expected, would reveal in miniature the results of this sudden war trade expansion on women's work, not only as it affected women in Bridgeport, but as it might be expected to affect them in whatever part of the country they are employed in making shells, arms, or other war material.

Information on the processes in which women were employed, on their pay and hours of work, on the danger of accidents, and the other conditions of their employment was obtained chiefly through interviews with a group of munition workers in their own homes. Supplementary data on living conditions and health were also obtained from members of their families and from social and civic agencies in Bridgeport.†

The industrial situation was discussed with a number of manufacturers in Bridgeport who made valuable comments concerning the production side of the munition industry and with officials of the

* The inquiry was conducted by Miss Amy Hewes, professor of Economics in Mt. Holyoke College, and formerly secretary of the Massachusetts Minimum Wage Commission. Miss Henriette R. Walter, of the staff of the Division of Industrial Studies of the Russell Sage Foundation, assisted in the field survey and in the preparation of the statistical tables.

† Valuable supplementary material concerning the social and civic activities by which Bridgeport is endeavoring to deal with its multiplying problems was given by Mr. George Gove, secretary of the Chamber of Commerce; Mr. George L. Warren, secretary of the Charity Organization Society; Miss Cynthia Moore, secretary of the East Side Young Women's Christian Association; Mr. Spencer R. Gordon, superintendent of charities, and others, to all of whom hearty thanks are due for their cordial co-operation.

machinists' union, who presented the situation from the point of view of labor.

Had the Foundation been given permission to make an exhaustive study of the plant it would have reported on wages as revealed on the pay-roll, hours of labor and the effect of overtime on output; night work and its productivity as compared with that of day work; health and safety and the methods of guarding against industrial accident and disease; and the regularity of attendance of the men and women employed. But this permission was refused. It is in the homes of the workers, however, that the social effects of an industry can best be studied, and in this inquiry, as in several others conducted by the Foundation, reliance was placed upon the method of securing facts from the workers themselves in their own homes.

The names of most of the women interviewed were taken at random from the 1916 Bridgeport directory. This list was supplemented by names suggested by fellow-workers and others. The wide diversity in the location of their homes and in their nationalities, incomes, and characteristics, to be described later, vouches for the representative character of the group. A copy of the record card used in making the investigation is appended to this report.* The information was secured in person and the schedules filled out by the investigators. The questions covered working conditions, hours, wages, and home conditions. One hundred

*See page 93.

and eighteen girls and women were interviewed. Of these, 18 were away from home, boarding or living in furnished rooms. Exactly 100 others were living with their own families, and in these cases information was added about the family income and the family expenditures, particularly the item of rent. The girls living at home gave also the essential facts about earnings, processes, and hours of work for 47 other women in their families who were employed in the munition industry, so that some information was obtained for 165 workers in all.

Two articles giving the main results of the inquiry have already been published in advance of this report,* in the hope that prompt dissemination of the facts discovered might help Connecticut citizens to strengthen their labor laws. The second of these articles, that dealing with the munition industry, was submitted in manuscript, in advance of publication, to officials of the Remington Arms-Union Metallic Cartridge Company for their criticism. This procedure, customary in industrial investigations made by the Russell Sage Foundation, was the more necessary in this case, because of the previous refusal of the company to give the Foundation the desired information. In the conferences which followed the reading of the manuscript, some statements were challenged, others verified, and additional material

* Hewes, Amy: Bridgeport on the Rebound. *The Survey*, pp. 49-51, October 14, 1916.
Hewes, Amy: Women as Munition Makers. *The Survey*, pp. 379-385, January 6, 1917.

was obtained, especially regarding changes made after the field work of the investigation was completed. In response to the suggestion of the company that no study could be accurate which was not based on data obtained in the plant itself, the Foundation offered to make such a supplementary inquiry before publishing the report. This offer was refused.

Since the declaration of war by the United States against the Imperial Government of Germany, in April, 1917, the findings of the study are of even greater importance than when it was made during the summer of 1916. The employment of women in the manufacture of war materials is bound to increase. Early in 1917, the War Department, as a preparation for what had long seemed inevitable, had already called upon the Department of Labor for 1,000 workers, both men and women, for the making of munitions in federal plants.* Now that we are in a state of actual war and will be obliged to make shells and guns not only for the countries whose ally we have become, but also for ourselves, we must needs take intelligent counsel of whatever experience we can lay hands on.

England, in her effort to manufacture huge quantities of munitions in a short time, in order to supply her army and navy at the front, went

* This call was made in February, 1917, for workers in the Dover (N. J.) and Philadelphia arsenals, to be filled through the employment exchanges of the Labor Department. Some protest was aroused because lower wage rates were offered to women than to men for similar processes of work.

through a bitter industrial experience. She wore out her workers, created industrial confusion, lost the labor gains of years, and raised the unjust cry that British workmen were "slackers."

Finally, a Health of Munition Workers Committee, headed by Sir George Newman, was appointed by the Ministry of Munitions to investigate ills and abuses in munition plants, and to make recommendations to insure increased production. The second part of this study gives a detailed summary of the findings of this committee. They dealt particularly with the conditions affecting output, including overtime, seven-day labor, night work, danger of accident and disease from fatigue, lack of proper food and housing conditions, welfare supervision, and the employment of children. An important memorandum was issued on women's work, with definite recommendations for safeguarding the health of English women.

Evidence shows that the working conditions of the women interviewed in Bridgeport during the summer of 1916 were similar in many respects to those under which English women worked for the first year or more of the war with such bad effects upon themselves and upon efficiency of production. Night work and overtime in Bridgeport were already found while yet the pressure of a war of our own was remote and production unstimulated by any call of patriotism. Even the crowded living conditions had begun to approach those in English centers.

But Bridgeport is only one illustration of sudden expansion due to the demand for speedy production of munitions of war. Its industrial and civic questions are of local importance in many other towns. The interest of the report here presented thus transcends that attaching to the record of any one plant or any one place. As a matter of fact, the working conditions in munition factories as well as the living conditions in munition centers have now become of vital importance to the whole nation. It is in the hope that this country may avoid a breakdown in the health of its women workers and a sacrifice of hard-gained labor laws to protect them, as well as the results to health and morals of congested living, that this study is offered.

CHAPTER I

BRIDGEPORT AND THE WAR BOOM

THE European War, with its unprecedented demand for munitions has metamorphosed Bridgeport, Connecticut, from a conservative municipality into a turbulent, congested community. This city on Long Island Sound has a long and varied manufacturing history; for years it has held an important place as the home of diversified industry in a part of the country in which factory towns have tended to become specialized. Fall River, Lawrence, and Lowell are known as textile cities, Holyoke and Dalton as paper towns, Lynn and Brockton as shoe manufacturing centers, but Bridgeport's manufactures range from submarines to graphophones, and include automobiles, electrical goods, corsets, and sewing machines, as well as a variety of foundry and machine-shop products. It is only recently that the expansion of the military arms and ammunition business has made Bridgeport known throughout the country as a city pre-eminent in the manufacture of munitions.

For the first few months of the war the city had apparently no inkling of the great change which was to come about. In common with other American cities it suffered during the winter of 1914-15 from the most serious shock to industry and trade that the country has had since the hard times following the panic of 1907. The daily papers tell

the story of unemployment and distress, of the efforts of the hard-pressed Department of Charities and the philanthropic associations to give relief, of the appointment of a special committee to solve the problem of unemployment, and of the difficulty of obtaining appropriations for any large-scale constructive measures. Except for the depression which such a period brings to any city, Bridgeport was progressing in an orderly and conventional manner. It had a population of something over 100,000, a transportation system which met its needs, a conservative city government, and was extending its suburbs and caring for its large foreign population by building new schoolhouses and taking steps towards revising its tenement house laws.

As early as March, 1915, however, the numbers of its unemployed had materially decreased and a few days later came a foreshadowing of the dramatic change that was to take place in the fortunes of the city. Large new factory buildings costing, it was said, $12,000,000, were under construction on the outskirts of the city and rumor had it that these were designed for the manufacture of munitions. Since 1867 Bridgeport had been the established home of the Union Metallic Cartridge Company, which had developed a sporting trade in addition to supplying cartridges to European governments and to the United States. In 1888 the owner of this company, Marcellus Hartley, acquired the Remington Arms Company, of Ilion, New York, and the two plants thus be-

came affiliated. Late in the spring of 1915 it became generally known that the new factories on the outskirts of the city were being built by the Remington Arms Company whose plant in Ilion was also at work on war orders, and that the new business in Bridgeport would afford opportunities for work to thousands of people in the making of guns. This announcement brought large numbers of men in search of work. There were jobs for all who came and before many months had passed the demand for labor outran the supply. The problem of unemployment was entirely forgotten. Each unit of the great factory was put into operation as soon as it was completed and machinery could be installed. The Union Metallic Cartridge Company also enlarged its plant, increasing its floor space by 700,000 square feet, and took on many additional employes. Other munition companies were formed, and concerns engaged in allied lines of business turned over large parts of their plants to the manufacture of war supplies.

In January, 1916, it was announced that the arms company and the cartridge company, both controlled by Mr. Marcellus Hartley Dodge, had been merged into the Remington Arms-Union Metallic Cartridge Company. The company was incorporated in Connecticut, with a capital stock of $60,000,000, all except a few shares of which were held by its president and chief owner.

During the summer of 1915, when the business boom had been growing daily and rumors of fabulous war profits had begun to spread, dissatisfac-

tion fermented in the labor world in Bridgeport and the city entered upon a three months' era of strikes. The expansion had found a nine or ten-hour day in nearly all factories. Labor was for the most part unorganized, but a shortage in the supply of workers, despite the rush of men to the city, and a rapid increase in rents, and the abnormal living conditions due to this rush made an unsettled situation in which labor difficulties rapidly developed. The real trouble began in a jurisdictional dispute in the construction of the arms factory, when the iron workers, who claimed that the millwrights should be affiliated with their own union, struck because the millwrights were classed and paid as carpenters. The millwrights joined the iron workers. Later the machinists in both the Remington Arms and the Union Metallic Cartridge Company factories struck for an eight-hour day, increased pay, time and one-half pay for overtime, and double pay for Sundays and holidays. Within two weeks the company granted increased pay and a forty-eight-hour week with a three-shift schedule, and the strike ended. With the eight-hour day and higher wages granted in one quarter, it was inevitable that dissatisfaction should spread to other factories. In spite of strong opposition by the Manufacturers' Association of Bridgeport, which continued to stand for a fifty-four-hour week, strike after strike, with the eight-hour day and increased pay as the principal issues, was brought to a successful or partially successful conclusion in favor of the workers.

A company manufacturing automobiles made an effort to avert trouble by introducing a profit-sharing plan; this the men rejected, and a strike was declared. The company then offered a choice between a bonus system and the eight-hour day. The employes voted for the latter and returned to work with the new system of hours but with the pay on a ten-hour basis. Strikes among the hundreds of women in the corset factories produced an eight-hour day and substantial increase in wages. From laundry workers to window cleaners, through the list of more than 50 strikes carried on in Bridgeport during the summer of 1915, the story is the same. At the end of the summer Bridgeport was practically an eight-hour city, with the prevailing rates of wages fully equivalent to those on the old basis. As an offset to these gains, however, night work, for both men and women, was on the increase, and the unions, although stronger than at the beginning of the struggle, were not in a position to enforce a closed shop policy.

With the cessation of labor troubles in the autumn of 1915, the city had settled into an acceptance of the new industrial order and the rapid changes which were following unavoidably upon it. Construction of the arms and cartridge factories proceeded rapidly, and the working force, increasing as one department after another was opened, was rated within a few months at a figure between 20,000 and 30,000. Other factories, of various types, continued to spring up in the outskirts of the city, bringing new suburban devel-

opments. Population increased at an unprecedented rate. The lowest estimate made at the time of the publication of the 1916 city directory placed the total population at 140,000, an increase of 37 per cent since 1910. The contagion of prosperity was everywhere evident. The shopping district of the city boasted the "seventh busiest corner in the world" (Main Street and Fairfield Avenue), and in the rush of business the narrow, crooked streets became wholly inadequate to accommodate the crowds. The trolley service failed to satisfy the demand for transportation and innumerable honking jitneys filled the streets. The foreign money order business in the overcrowded local post office showed an increase of about 88 per cent in the year ending July 31, 1916, over the previous twelve months. The business of the town clerk's office during the month of August, 1916, was twice that of August, 1915, an increase largely due to the impetus to realty transfers. Property changed hands rapidly, mortgages were placed on businesses and homes in order to raise money for new ventures, and banks, firms, and individuals showed a willingness to lend money on Bridgeport security. The big capital stock of the Remington Arms-Union Metallic Cartridge Company and its incorporation in Connecticut, taken in conjunction with the substantial character of its new buildings and the rumors of continued war orders, led business men as well as workers to believe that the business represented in this huge concern would be relatively permanent, and that its im-

mense trade would serve to stimulate the activity of the other large manufacturing interests of the town.

Among the municipal problems which the rush of people to Bridgeport in 1915 had brought the city was that of proper housing. This problem had grown to serious proportions. It had become for many workers not a question of finding a decent place in which to live, but of finding any place whatever in which to live. Real estate agents ceased to have houses to offer. Rents jumped almost instantaneously. As a result families who were unable to pay the increased rates were evicted, and were unable to find vacant houses for the rents which they could pay. Some of these were actually sent to the city almshouse until they could find houses; others became for the first time dependent upon charity; others still were able, with accompanying hardships, to readjust their family budgets and to give a much higher proportion for rent than formerly.

The Remington Arms-Union Metallic Cartridge Company, as early as the spring of 1915, had begun buying large tracts of land and building a system of "company houses," but the completion of a number of these was delayed and even had all been ready for occupancy in 1916 they would have provided only a fraction of the number of houses required. Hundreds of desirable men, many of them with families, came to the city only to go away again, because they could find no place to live.

Throughout all these changes, it seemed to outsiders that while business men had seized upon the high commercial importance these had wrought, the municipality itself was hardly conscious of its own new responsibilities. The visitor to Bridgeport saw the thronged streets, the halting transportation service, the lack of recreational facilities, the flimsy three-decker tenements for which rents double those of a year before were asked, and marvelled at the apparent failure of the city government to take cognizance of the fact that it was no longer a middle-aged, conservative New England manufacturing city, but a "boom town," full of great possibilities for good or harm, for ugliness or beauty, for loyalty or bitterness, in its new industrial army.

But the year 1916 saw the inception of a new spirit in Bridgeport. Even while the city seemed to be asleep, new ideas were fermenting. Bridgeport had ceased to be a typical American industrial city and had become a unique American civic community. How it treated its newly imposed housing, health and recreational problems, as well as how its women workers fared while making shells for the Remington Arms-Union Metallic Cartridge Company is told in the following pages.

CHAPTER II

THE WOMEN AT WORK

THE hundreds of young men who crowd Bridgeport's brilliantly lighted streets on Saturday and Sunday nights are part of a mobile industrial force which can travel from city to city in response to the lure of good work and good pay. The force of working women, instantaneously as it may and does respond to a demand for labor in its own neighborhood, is more inert, less capable of severing family ties and setting aside home responsibilities to follow the call of opportunity in other cities. The men in the munition factories are said to be gathered from all parts of the United States, while the majority of the women in the shops are from the city of Bridgeport itself. All but nine out of the 118 women* interviewed in the summer of 1916 had lived in Bridgeport more than two years, and all but 17 had lived in the city more than five years.

As the demand for women's work in the munition plants increased the most easily utilizable source of additional labor proved to be the working force in the other industries in Bridgeport.

* The number of women interviewed comprised 100 women living at home and 18 away from home. From the 100 women living at home, some information was obtained concerning 47 others employed in the industry; the total was thus 165 (see page 6). The discussion in this chapter has reference only to the 118 directly interviewed.

The corset factories, metal works, and textile mills already employed large numbers of girls and women, many of whom were easily attracted by cartridge-making. The result to the affected industries was a dearth of workers evidenced by widespread advertising of an unusually urgent character; prospective employes were assured that the positions offered had the advantages of high wages, short hours, and permanency. The gradual drain, felt first in the neighboring factories, extended through one occupation after another, until it was believed to be responsible even for the shortage of saleswomen and domestic servants, not only in Connecticut towns but in towns in nearby states.*

At the same time the munition industry was stabilized by an important constant element in its labor force, illustrated by the fact that 57 out of the 118 women interviewed had worked for the company for at least five years. One woman had worked for the same concern for thirty-two years, and her mother before her had done the same work as a girl.

The venturesome women who came from outside the city proved to be real fortune-seekers on the industrial frontier. A nineteen-year-old Jew-

* The demand for women munition workers was held accountable for a shortage of domestic servants in New York City. In August, 1916, the superintendent of the public employment office in New York stated that a representative of a munition factory in Bridgeport called on him frequently to see if there were any women willing to work in munition plants, and that similar requests were received from munition factories in New Jersey.

ish girl who was working as inspector in the cartridge shop told the story of leaving her home in Russia, of the crossing in the steerage, and of her school days on New York's lower East Side while her father supported the family from the proceeds of a pushcart business. Coming to Bridgeport for a visit to an aunt, this girl saw a new opportunity for herself and her family. She quickly gave up her poorly paid clerical position in New York and went into the munition factory. In a short time she had persuaded her parents and her two brothers to follow and settle in the city, and had helped her ambitious fifteen-year-old brother to start a four-year apprenticeship with the arms company, during which he could earn enough to support himself until he could draw the wages of a skilled workman.

Out in Saskatchewan a Danish veterinarian was settled with his wife and daughters. It was a lonely place for young people, and the oldest daughter persuaded her father to let her come to Bridgeport with a school chum who had heard of the chances in the munition factories. Although she was unaccustomed to factory work she made $12 a week from the start. She found a comfortable home with some of her own country people, and was carefully hoarding her earnings for her trousseau, for she had become engaged to a young Englishman in Bridgeport just before he left for the trenches. As soon as the North Sea should be safe she planned to go back to Denmark, whither her family had returned soon

after she left them, and there she would make ready for her wedding.

A young woman who a few months before had been a poorly paid operative in a shirt factory in Rhode Island is an example of the intelligence and enterprise often found to be characteristic of the women munition workers. She heard of the demand for girls in Bridgeport and, spurred by the inadequacy of her own earnings and the irregularity of her father's, came to the city on a prospecting visit. With no trouble she immediately found work in the cartridge shop. At almost the same time she had the good fortune to find a room with a woman who was just about to give up her flat and move to another city. She seized the opportunity to rent the flat so as to have a place where her family might settle. She then sent for her father and sister and for a girl friend. The reunited family took possession of the rooms on the same day that the former landlady moved out. The father, who had been a painter by trade, also found work in the shops, and the other two girls went to work in the cartridge factory in which the first girl was working. All four shared alike in the household expenses, and the girl's venture in transplanting the family promised success.

Not all workers new to Bridgeport and the industry, however, had been pioneers and pathfinders for their relatives and friends. Several were interviewed who had come alone and stayed alone. Others had come with their entire families.

For example, one American family from near Boston, composed of father, mother and 12 children, had been transplanted en masse, and while the father was not well enough to work, the five sons and daughters who were of working age were employed in either the arms or the cartridge shop.

The majority of the girls who had had working experience before going into munition work came from other manufacturing occupations in Bridgeport or elsewhere. Table 1 shows the last previous occupations of the girls investigated.

TABLE 1.—LAST OCCUPATION BEFORE ENTERING THE MUNITION INDUSTRY, FOR 73 WOMEN MUNITION WORKERS INTERVIEWED

Previous occupation	Women
Factory work	47
Corset manufacture	*15*
Manufacture of machines, tools, and fixtures	*8*
Textile manufacture	*6*
Metal work	*6*
Clothing manufacture	*6*
All other work	*6*
Sales-work	13
Domestic and personal service	6
Custom dressmaking	2
Office work	2
All other occupations	3[a]
Total	73[b]

[a]Includes farm work 1, home work on neckties 1, and "odd jobs" 1.
[b]Of the 118 women interviewed, 45 had never been gainfully employed before entering the munition industry.

Fifteen of these munition workers had been corset makers, an important occupation for Bridgeport girls, since Bridgeport is one of the largest corset-making centers in the country, and has places for hundreds of girls in that employment. Other common factory work included the manufacture of textiles, metals, and tools. Outside of

factory occupations, sales-work was the previous occupation most frequently reported. The table brings out the fact that it was possible for the munition industry to draw its workers from a wide range of occupations, for it makes small demands in the way of training and experience. Indeed, considerably more than one-half of the 118 women had had no previous factory work of any kind, and 45 had had no previous gainful occupation whatsoever.

It should be noted that the foregoing table does not show the drain upon other industries caused by the war boom, since 94 of these women had held their positions in the cartridge factory some time before the boom began; that is, for two years or more before this investigation was made.

These facts raise the question as to whether the group interviewed in the investigation was not composed of a disproportionately large number of girls who had worked in the munition industry before the war began, with an insufficient representation of those lured into it from other industries or other cities when the sudden expansion required new recruits. As a matter of fact, according to statements by officials of the company, the increase in the number of women employed in their plant was not so large as had been anticipated. In November, 1915, it was expected that 4,000 additional girls and women would be needed between the following January and June, and yet by the summer of 1916 the total force of women in the factory was not more than 4,000. That part

of the new force which had come from other cities proved to be to a great extent shifting and unstable, so that while a large number of women had come to Bridgeport with the boom, the factory force was not proportionately increased. It seems probable that the group interviewed was representative, composed as it was of workers from other occupations and a fair proportion of women never employed in any other industry. The latter represented in part girls who had engaged in cartridge making before the war boom, and in part the potential labor supply of women always available in a fair-sized city when slight extra inducements, coupled with increased cost of living, draw them into the labor market.

The birthplaces of the 118 women and the nationalities of their fathers are shown in Table 2.

TABLE 2.—NATIVITY OF WOMEN MUNITION WORKERS INTERVIEWED AND OF THEIR FATHERS

Country of birth	Women whose country of birth was as specified	Women whose father's country of birth was as specified
United States	99	54
Foreign countries	19	64
Austria	..	2
Bohemia	1	2
Canada	2	4
Denmark	1	2
England	5	11
Germany	..	9
Hungary	1	10
Ireland	3	11
Italy	1	2
Norway	1	1
Poland	..	3
Russia	1	2
Scotland	3	4
Switzerland	..	1
Total	118	118

More than one-half of the group of women munition workers were foreign-born or of foreign parentage. Fifty-four were native born with native-born fathers, and 45 others were native born but of foreign parentage. Eleven of the 19 foreign-born girls came from the British Isles (five from England, three from Ireland, and three from Scotland), leaving only eight who were born in other European countries. Of the foreign-born fathers, 26 came from the British Isles. Eleven of the women were of German or Austrian parentage, but they were employes of many years' standing. Several of them told the investigators that no new workers of German origin had been taken on at the plant since the beginning of the war boom.

Often the long-experienced workers were bitter against the "foreigners" and blamed them vigorously for the problems in living and working conditions. An Irish-born girl said proudly, in a rich brogue, that there were no foreigners in her room in the factory. "The boss is a pleasant Irish gentleman, and he won't stand for them. Come to think of it, there is a few Polish girls, but they're real refined and they speak the language almost as well as I do myself."

Since the processes of cartridge making require workers with quickness and dexterity rather than long training, it is natural that young women should make up the major part of the group. Table 3 shows the ages of those who were interviewed.

TABLE 3.—AGES OF WOMEN MUNITION WORKERS INTERVIEWED

Age	Women
Less than 18 years	5
18 years and less than 21	27
21 years and less than 24	32
24 years and less than 27	16
27 years and less than 30	9
30 years and less than 33	7
33 years and less than 36	5
36 years and less than 39	6
39 years and less than 42	3
42 years and less than 45	3
45 years or more	5
Total	118

Exactly one-half of the 118 women were between eighteen and twenty-four years of age, and less than one-fourth had reached the age of thirty. In the youth of the girls employed cartridge-making affords a parallel rather than a contrast to other manufacturing occupations. According to the Federal Census 37 per cent of all women engaged in manufacturing occupations are under twenty-one.* A number of women said that they had begun work at the age of twelve or thirteen, and three even younger, indicating a formerly lax enforcement of the child labor law, or the lack of any effective law at the time when they went to work. Forty-three began when they were fourteen years old, and all but eight were at work by the time they were eighteen.

As might be expected from their youth, the majority were unmarried. Conjugal condition is shown in Table 4.

* Thirteenth U. S. Census, 1910, Vol. IV., Occupation Statistics, p. 312 ff.

TABLE 4.—CONJUGAL CONDITION OF WOMEN MUNITION WORKERS INTERVIEWED

Conjugal condition	Women
Single	96
Married	11
Widowed	7
Deserted	3
Divorced	1
Total	118

As many as 81.4 per cent were single. Some of the married women welcomed the possibility of work in the shops, for they might not have been able to meet the conditions of employment in any other occupation. The opportunity to work at night gave them a chance to manage their households and to earn money at the same time, and exhausting as the strain was, the extra income meant a valuable piecing out of the family resources. Although the percentage of married women in the group investigated seems comparatively small, the application to the total force of 4,000 women employed in Bridgeport of the proportions shown by the table would indicate that approximately 370 married women worked in the munition plants, and that the number of widows and deserted or divorced wives employed was about as large. Many of these women had homes and children to care for.

The personal information given by these 118 munition workers shows, then, a relatively stable class of working women, with whom had mingled a few venturesome recruits from distant places. Their earlier working experience was varied and

rarely related to cartridge-making as a preparation or training. Alert and ambitious, interested and willing to talk of their work and its advantages and handicaps, they were prepossessing representatives of American working women. Among them were natives of 10 foreign countries, but the large majority were girls born in the United States, educated in American schools, and settled in Bridgeport before the war boom. Many of them had worked in this occupation for years; nearly half, five years or longer. About one-fourth were thirty years old or more. Only one in 20 was less than eighteen, but the majority were not yet twenty-four.

They represented the important tasks for women in cartridge-making and their clear descriptions of their work gave a vivid picture of women in munition plants.

CHAPTER III

CARTRIDGE MAKING AND ITS DANGERS

ALTHOUGH Bridgeport manufactures a variety of munitions, nearly all of the thousands of women employed in connection with them are at work upon one single product, cartridges.* For the most part their work is fairly light and easy and calls for natural dexterity and speed rather than for long training. The shell of the cartridge, or the cartridge case, is made by fashioning a small round disk of brass or copper into a thimble-shaped metal cup, which in successive processes is drawn out into a longer, thinner tube. It is finally equipped at one end with a small percussion cap called the primer and tipped at the other with the bullet. The explosion of the primer fires the charge of powder which in turn sends out the bullet.

PROCESSES

Several of the early processes on the cartridge cases are performed on dial machines, before which the women operators are seated. The women receive the material in the form of the small brass cups from which the cartridge cases are to be formed. The worker slips the cups into hollow dies set in the revolving dial, and these pass under

* See note, p. 3.

punches which draw out the cups into longer and thinner cylinders. The women said that this work (called drawing) was easy but very exacting and something was "apt to happen to the machine" if their attention was diverted. Sometimes the machines were run at such speed that they had to be stopped to allow them to cool, and they were likely to get out of order when geared high.

The successive drawings leave the tubes uneven in length, and they are clipped to conform to standard. Women feed the shells into automatic machines which perform this process, known as trimming.

After the cartridge case has been shaped, the "head" is fitted with a small percussion cap called the primer, a process which is also performed on a dial machine. The primer has already been loaded with fulminate of mercury, one of the most powerful explosives used, and the girls are always afraid the primers will explode in the machine if they are in any way defective.

Unless the cartridge conforms precisely to specified dimensions and structure it is a worthless product. To avoid premature explosion, failure to explode at all, or failure to fit the rifle for which it is made, its parts must be carefully inspected again and again throughout the process of manufacture. Large numbers of girls worked as inspectors, an occupation which requires good eyesight, but for which youth and inexperience are not obstacles. "We are running a kindergarten

in our department this summer," said a woman who was in charge of a number of fourteen and fifteen-year-old girls who were working as inspectors in the summer, but were planning to go back to school in the autumn.

One of the most important inspections takes place just before loading. The girls watch for any imperfections and especially for "high" primers, or primers that are not fitted closely down into the heads of the shells. Another important inspection occurs just after charging. The girls make sure that the proper amount of powder is in the shells, that none have been left half-empty, and that no powder is spilled.

Formerly women had actually loaded both primers and shells, but by the summer of 1916 this part of the work was usually done by men. Working at the machine which inserts the charge of powder in the open end of the empty cartridge case, or "shell," is a group which usually consists of two men and four or more girls. The girls fill plates with primed shells and the men place them in the machines which put into each shell the proper amount of powder. According to the company officials, smokeless powder is used for war goods, and is much less dangerous to handle than black powder.

The number of girls included in the investigation who were at work in these different processes is shown in Table 5.

TABLE 5.—OCCUPATIONS OF WOMEN MUNITION WORKERS INCLUDED IN THE INVESTIGATION

Occupation	Women
Inspecting	33
Heading	12
Plate filling	12
Priming	12
Drawing	11
Trimming	11
Packing	9
Gauging	5
Loading	4
Miscellaneous	31[a]
Total	140[b]

[a]Includes anvilling 3, instructing 3, annealing 2, pointing 2, shelling paper shells 2, stamping 2, varnishing 2, winding 2, assembling 1, drilling 1, lubricating bullets 1, making battery cups 1, pasting 1, placing wads in paper shells 1, piercing 1, shaking 1, sizing primers 1, stock work 1, swaging 1, weighing 1, and labeling 1. Some of these processes were performed in making sport goods.

[b]Information as to occupation is not available for 25 of the 165 women included in the investigation.

About a fourth were inspectors. Others were drawing, trimming, priming, plate-filling, heading, packing, gauging, and loading, while in a miscellaneous group no less than 21 other processes were represented.

Cartridge-making, with its many processes, is not a new occupation for women, but the rush of war orders and the speeding up process, seemed likely to increase the liability to accidents and disease.

DANGERS

For the six months from May 25 to November 25, 1916, 574 accidents to munition workers in the fourth district of the state, resulting in incapacity for a day or longer, were reported by employers, in accordance with law, to the Connecticut

Workmen's Compensation Commission. All the plants which manufacture munitions in this district are situated in Bridgeport. In the only two plants which employed women, 33 accidents to women occurred. During the same period, in one of the largest plants of the district, 83 claims for compensation were made by munition workers, of which 25 were made by women. Something more than trivial injury is implied in these cases, since by the terms of the law, compensation cannot be claimed unless disability has lasted for more than ten days.* Thus it may be said with almost exact accuracy that in the munition industry in Bridgeport one woman was injured each week throughout the year seriously enough to disable her for ten days or longer. These figures, of course, take no account of injuries due to industrial poisoning, or to illness caused directly or indirectly by the work and its conditions.

Representatives of the company have made the statement that while there have been a few fatal accidents among the men, there have been no fatal accidents to women workers for several years. They also declared that a committee on accidents exists, and that thousands of dollars have been spent on safety appliances, but as further information was denied the investigators, the methods of

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* Under the Connecticut Workmen's Compensation Act, compensation amounting to 50 per cent of weekly wages is paid during the period of disability for injuries causing incapacity for more than ten days. Work accidents resulting in incapacity for ten days or less are not compensated.

the committee cannot be described here nor its efficiency gauged.

Fear of the danger of accidents was constant among the employes, and together with rumors that were rife indicated the need for such a frank policy of publicity as to accident prevention as has been adopted by progressive employers elsewhere. The girls' statements are of great significance as suggesting the psychological difficulty of working in constant fear. Some had seen serious or even fatal accidents, and a number who had themselves experienced injury told the investigators of hands maimed by exploding primers or fingers crushed in the presses. One girl showed two crooked fingers, permanently stiff, which had been injured by an unguarded machine a year and a half before. The punch broke, flew out and penetrated the two fingers; blood poisoning set in, and the girl suffered severely for two months. "I often used to complain about that machine," she said, "but they didn't put guards on it until after I was hurt." Her case was one afterwards found on the records in the Bridgeport office of the Workmen's Compensation Commission of Connecticut.

Work with the loaded primers and shells, they said, was never free from danger. One worker described her experience some years before when a girl beside her in the loading room was killed, another seriously injured, and she herself struck by a piece of machinery. "We always run," she added, "but you never really have time to get away. It's all over before you know what's hap-

pened. It's just as if a big wind came and blew you across the room."

Even small explosions made the new girls very nervous, but through familiarity with danger experienced workers paid little attention to it. A kind of fatalism possessed some of them. "We have only once to die," said a woman who had seen men seriously injured, and had herself been prostrated by the force of an explosion, "and it might as well be in the shops as anywhere else."

Workers spoke of the fact that the charging machines had lately been "put in cages," as one of them explained, "so if there's an explosion they won't fly all over the room." The general testimony was that since the passage of the Connecticut Workmen's Compensation Act in 1913 the machines have been better guarded. But accident prevention has not gone far enough to rid work in the loading rooms of serious dangers.

Furthermore, after injuries are received a general ignorance of the terms of the law or a kind of inertia about taking the necessary legal steps often prevents employes from getting the assistance provided by the terms of the act. "One of the firemen told me I could get compensation from the company," said a woman whose eye had been hurt, "but I've never bothered about it," thus expressing in one casual sentence the attitude of many of the employes toward the accidents that happen during the course of their work.

In common with other American states (excepting Massachusetts and California), Connecticut

makes no provision for compensation for occupational disease.* Processes in the munition industry requiring the use of fulminate of mercury entail a double risk. Not only is there need of constant caution on account of possible explosions, but also from the risk of poisoning. Fulminate of mercury is irritating to the skin and to mucous membranes. The Newman Committee in its studies of the health conditions in English munition plants recognizes fulminate dermatitis and conjunctivitis as one of the industrial intoxications caused by work on war material.†

Many of the women working on the priming machines and in the loading room in the Bridgeport factories attributed eruptions of the skin, inflamed eyes and abscesses to the use of fulminate of mercury. Several showed little scars on their hands and arms where eruptions had "dried up." Individuals differ greatly in their susceptibility to this irritant, many being able to handle it with impunity, while others develop inflammation of the skin so severe as to necessitate their giving up the work. One girl who two years before had left a lower paid position in a store for a $12 one in the munition factory believed that the fulminate of mercury was undermining her health. She said that she felt sick most of the

* An amendment to the Compensation Act, introduced into the Connecticut legislature in the winter of 1916-17, provided for the inclusion of occupational diseases, but failed of enactment as law during the session.

† Health of Munition Workers Committee. Memorandum No. 8. Special Industrial Diseases, p. 6. London, 1916.

time, and that few girls stayed in her department long.

In this factory, according to the company's statement, as many as 1,500 men and women were exposed to the danger from fulminate. Officials admitted that they had recognized the danger and said that about every two months their own physician made medical examinations of the workers who handled fulminate, and that it was their policy to transfer to other departments those found suffering from poisoning. Such steps as these are recommended as preventive measures by the Newman Committee which also urges protective clothing for workers exposed, and facilities and opportunities for frequent washing.

In our own country Dr. Alice Hamilton of the United States Bureau of Labor Statistics, who has made special investigations of occupational poisons for the bureau, in a letter to the Foundation, gives similar advice concerning fulminate poisoning:

> Scrupulous personal cleanliness is the only preventive of this form of poisoning, and this would really involve frequent hand washing, for it is almost impossible, especially in hot weather, to avoid touching the face or neck or arms with the fingers. For those who are very susceptible to fulminate poisoning, there is nothing to do but to give up the work. Otherwise they run the risk of a very distressing eruption which may spread over the whole body.

Although the company stated that it had spent large sums of money in installing sanitary appara-

tus and that when the plants were enlarged and rebuilt the sanitary arrangements were greatly improved, one worker employed in a process in which she handled fulminate reported that employes in her department were forbidden to wash their hands until after the factory whistle blew for dismissal, and that the only washing facilities were long troughs with a number of spigots. She also said that no towels were provided. In England, the Newman Committee recommended that protective clothing, overalls, caps, veils, and aprons should be supplied in all munition factories. No such precautions were reported in the Bridgeport shops.

In addition to the facts already noted that in Connecticut no compensation is provided for injury due to industrial disease, and that workers suffering from accidents may claim no compensation unless disabled for more than ten days, there is still a third to be mentioned. The Connecticut compensation law requires the payment of only 50 per cent of the injured worker's wages. In contrast with the more advanced legislation in other states, such as New York, Massachusetts and Ohio, which allow two-thirds of wages, this is inadequate. The larger percentage of wages to be paid during disability is, of course, a greater incentive to employers for prevention, as well as a more adequate protection for the worker whose normal income is cut off because of an accident, while his expenses are usually increased.

CHAPTER IV

HOURS OF LABOR AND NIGHT WORK

THE urgent need for speed and the desire for maximum output without too great an increase in the capacity of the plant led to the employment of women for long hours by day, and to the organization of night shifts, in order that there might be no cessation in production at any time during the twenty-four hours. It is commonly supposed that such a scarcity of labor as prevailed in Bridgeport when its industries began to expand gives workers an advantage in bargaining and enables them to secure favorable conditions. The story of what happened in this community is, therefore, of more than local importance. Neither the shortage of labor nor the labor legislation of the state proved to be a real protection for the unorganized working women against the well-known dangers of long hours and night work.

Since the outbreak of the war, Bridgeport has had the reputation of being an "eight-hour town." The impression is doubtless due to the widespread story of the successful strikes for the shorter work day carried on during the summer of 1915, as already described. Wages did not appear to be rising with profits, and, as rents and the cost of living were increasing, unrest prevailed. It was then that Bridgeport was disturbed by the numer-

ous strikes which established the eight-hour day with ten-hour pay in so many industries.

It is a common experience, however, that to insure the continuance of gains suddenly won some form of organization is needed. Sometimes new standards may be maintained by the enactment of a labor law; sometimes their permanence depends almost wholly upon the effectiveness of trade unionism. The women in the munition industry had not themselves won the eight-hour day through their own efforts, and were not organized to maintain it. Hence they were unable to offer any effective resistance when little by little they were robbed of the gift, their schedules of working hours being modified, first by frequent overtime, and later by the company's regarding this overtime as part of the regular daily hours. "We are still considered an eight-hour department," said one worker in 1916, "but considering don't make the day seem any shorter when they keep us working ten hours as they did every day last week."

The women were reluctant to return to the longer hours. "If the girls had only stuck together we could have kept the eight-hour day," said one, "but you can't do anything with those foreign girls." The money earned by the time over eight hours was often referred to as a "bonus," but in fact the extra work was usually paid for at exactly the same rate as the previous eight hours. Generally the girls would gladly have exchanged the additional pay for the two hours' leisure.

On one of the hot summer days a busy worker said: "We begin at seven in the morning and if the work piles up on the boss, we have to stay till five or six o'clock in the evening. That's been pretty regular for the last three or four weeks. I was all in yesterday, and when four o'clock came I told the boss I couldn't sit at the machine any longer, but he wouldn't let me off."

That by 1916 the eight-hour day was not universal is shown in Table 6, indicating the daily hours of the women interviewed during that summer. The schedule was not uniform in all departments, and for some workers it varied on different days of the week. The table shows the longest day in each weekly schedule, since the long day was most frequent during the week.

TABLE 6.—DAILY HOURS OF LABOR FOR WOMEN WORKERS INCLUDED IN THE INVESTIGATION

Daily hours of labor[a]	Women
Less than 8 hours	36
8 hours and less than 9	45
9 hours and less than 10	14
10 hours	39
Total	134[b]

[a]In cases where the schedule varies on different days of the week, the longest day has been tabulated, since this is the length of working day which occurs most frequently during the week.

[b]Information as to daily hours of labor is not available for 31 of the 165 women included in the investigation.

Thus nearly three women in 10 worked ten hours a day, and 53 of the 134 reporting worked nine hours or longer. The phrase in the table, "less than eight hours," means the actual working time exclusive of time allowed for lunch.

The luncheon time for this group was fifteen minutes. Thus "less than eight hours" actually represented the eight-hour shift. The extraordinarily short luncheon recess was a peculiarity of the eight-hour schedule and was usually mentioned as the principal objection to the shorter day. Nearly everybody found fifteen minutes too brief to be either salutary or restful. Moreover, in certain rooms the workers were not allowed to leave during that time and the foremen were careful to see that the limit was not exceeded. In other cases the quarter hour could be stretched to cover twenty or twenty-five minutes. Some girls, especially those who on account of the early hour of beginning work had left home without breakfast, ate their lunches at their machines whenever they liked. In a few instances where the eight-hour day had been succeeded by ten hours, a corresponding change in the length of the lunch time had not been made and the long stretch was relieved only by the brief quarter hour interval.

Students of the effects of industrial fatigue have laid stress upon the dangers of long working hours without proper intervals for rest and food. The recommendations of the English Health of Munition Workers Committee* are emphatically in favor not only of an hour for the main meal period, but also of short breaks of ten or fifteen minutes during the long spells of work. Even on eight-hour shifts the minimum allowance for meal time should, in their opinion, be half an hour.

* See Part II, pp. 135-137.

After the proper co-ordinations are learned high speed has few inherent dangers; but if women driven to a pace that approximates their maximum possible speed are kept at work without adequate intermission throughout a long day, or even a comparatively short one, cumulative fatigue sets in.

Table 7 shows the length of the lunch period for the women for whom information on this point was secured.

TABLE 7.—LENGTH OF LUNCH PERIOD FOR WOMEN MUNITION WORKERS INCLUDED IN THE INVESTIGATION

Length of lunch period	Women
Fifteen minutes	46
Thirty minutes	4
Sixty minutes	85
Total	135[a]

[a]Information as to length of lunch period is not available for 30 of the 165 women included in the investigation.

The majority, 63 per cent, had a full hour for lunch, but 34 per cent had the short recess of only fifteen minutes. Eight hours with an interval of but fifteen minutes at the task of slipping endless successions of small brass cups into revolving dials, with machines run at a speed so high that they must be stopped at intervals to allow them to cool, or of feeding shells into automatic machines, or of testing cartridges hour after hour, cartridge after cartridge, with the discovery of defects as the only break in the intensity of attention is a strain that should be required from no one.

Twenty-one-year-old Nellie, even though she came fresh from a New Hampshire farm, found the eight-hour day's work on the heading machine very heavy. "The vibrations of the big machine shake your body so that after a few hours you're all tired out and nervous. There never is a day when I'm not tired at night, and I'm as strong as most."

It has already been shown that in the different departments of the plant the schedules of hours were not uniform, and even for the same worker the length of the days varied within the week. The length of the working week showed, therefore, great diversity, as Table 8 indicates.

TABLE 8.—WEEKLY HOURS OF LABOR OF WOMEN MUNITION WORKERS INCLUDED IN THE INVESTIGATION

Weekly hours of labor	Women
45 hours and less than 47	35[a]
47 hours and less than 49	45
49 hours and less than 51	6
51 hours and less than 53	..
53 hours and less than 55	16
55 hours	29
More than 55 hours	2
Total	133[b]

[a]Of the 35 women in this group, 1 worked 46½ hours one week and 39¾ hours every alternate week.
[b]Information as to weekly hours of labor is not available for 32 of the 165 women included in the investigation.

More than one-fifth of the women whose hours could be ascertained worked the legal limit of fifty-five hours. According to their own statements, two worked more than the maximum time allowed by law. The majority worked less than forty-nine hours a week. "The long day certainly

does take the starch out of you," said one girl who had worked fifty-five hours a week. These facts, taken in connection with Table 6, showing the daily hours on the longest day for each worker, indicate that long days were offset by shorter days in such a way as to secure a comparatively moderate working week. Nevertheless, it is the usual experience of workers that an eight-hour day on two days of the week cannot fully compensate for the fatigue of a ten-hour day on the other four.

The variations in the working day were illustrated in the hours of one young girl who was employed at the process of anvilling. She began work at 7 a. m. She was working 53½ hours a week on an irregular schedule which set the closing hour at five o'clock the first three days of the week, four o'clock on the fourth, and three o'clock on the last two, with only a quarter of an hour for lunch each day of the week.

In the hours of beginning work, listed in Table 9, we have further indication of variations in the individual schedules.

TABLE 9.—HOUR OF BEGINNING WORK FOR WOMEN MUNITION WORKERS INCLUDED IN THE INVESTIGATION

Hour of beginning work	Women
7 a.m.	126
3 p.m.	9
6:30 p.m.	3
11 p.m.	2
Total	140[a]

[a]Information as to hour of beginning work is not available for 23 of the 165 women included in the investigation, and two others not counted in the table began work at 7 a.m. one week and 3 p.m. the next.

The large majority of the girls for whom information was secured went to work at seven o'clock in the morning. Others began at three o'clock in the afternoon, at half-past six in the evening, or eleven o'clock at night. According to statements made by representatives of the company, three months later, namely on December 5, 1916, the summer of 1916 had been a transitional period in the management of the works. Under a new administration new schedules of hours had been gradually introduced in different departments and women were then employed in the works in but two shifts. The day shift worked the first five days in the week from 7 a.m. to 4:36 p.m., with one hour off at noon, and on Saturday from 7 a.m. to 12 m., a total of eight hours and thirty-six minutes on each day from Monday to Friday, with a working week of forty-eight hours in all. Overtime might prolong the day until 6 p.m. five days in the week, making a total working week of fifty-five hours, the limit allowed by the Connecticut labor law. The night shift worked from 6:30 p.m. to 4:36 a.m., with a half-hour recess, nine hours and thirty-six minutes each night from Monday to Friday, inclusive. The overtime schedule was reported to be until 5 a.m., making ten hours a night and fifty hours a week. Thus, although the hours have been changed, night work for women continues, and both by day and by night women not infrequently work as long as ten hours. Moreover, the changes have resulted in lengthening rather than in shortening hours.

Night work for women was a conspicuous fact in the neighborhood of the big Bridgeport cartridge factories when the field work of this investigation was in progress in July and August, 1916. About seven in the evening a crowd of men and children began to line up outside the factory fence, carrying packages of food. Many of them were the husbands and children of the women who worked on the early night shift from 3 p.m. until 11 p.m. During the fifteen minutes' rest period which came at seven o'clock they hurried down to the fence to get their lunches. Again, an hour before midnight, the women came out of the factory with the crowds of men, and their places were taken by others who worked until seven o'clock in the morning. The day workers began at seven o'clock and stopped at three. In this way the twenty-four hours were divided into three eight-hour shifts. In some of the departments which operated on a different schedule women stayed all night long, working from half-past six at night until five in the morning.

With few exceptions night work was unpopular with the young working girls of Bridgeport. Their natural desire for recreation, for the society of young people, found no outlet while they had to work or sleep in the evening hours when most of their friends were free. In fact, night work was not in great favor with those of any age. An exception was a widow who worked from 11 p.m. until 7 a.m., leaving her four-year-old daughter in her sister's care. She said that she liked the work

in summer at night because the factory was cool then, and, except when the weather was very hot, she could usually manage to get about six hours' sleep in the daytime. Almost every one else who worked at night objected to it. Sufficient sleep was hard to get. Street noises and the ordinary household happenings made it doubly difficult to become accustomed to the unusual hours. Change of meal times often meant loss of appetite and indigestion. Women in some departments were moved back and forth every two weeks from a night shift to a day shift, and these conditions made it even harder to acquire the habit of sleeping by day. Moreover, to timid women, who went to and from their work in the late hours of the night and in the early morning, the dark and lonely streets seemed a perpetual menace. To those who lived a long distance from the plant there was the difficulty of transit, for car service was overtaxed and during these hours jitneys are not always safe, especially for young girls.

One girl who had been working in the cartridge factory for seven years in several different departments had been doing "priming" for six months. The preceding winter she worked on the night shift from 6 p.m. to 6 a.m., but she found it impossible to eat or sleep normally and "nothing seemed right," so she changed back to the eight-hour day shift as soon as she could. "The girls certainly earn every cent they get," she said. "We have to work every minute without any let-up at all."

Another, who alternated a day shift for two weeks with a night shift for the same period, said that although the two-week interval was not long enough for her to get accustomed to sleeping in the daytime, anything was better than working on the eleven-to-seven shift all the time, because being out on the streets late at night made her so nervous. A married woman, who had come to Bridgeport at the beginning of the boom, and whose husband also worked in a munition factory, said that she was first put on the shift from eleven at night until seven in the morning, and that at about five in the morning she used to get so drowsy she could hardly work. Later her hours were changed to the shift from 3 p.m. to 11 p.m., and she liked that much better; yet there was always the matter of getting home after eleven. She had learned not to take a jitney unless the passengers were women only.

Mrs. J., an American-born woman who married a foreigner, and was helping to support their four children by working in the shops from half-past six at night until five in the morning, said that although the people on her shift were in the factory for ten hours and a half they did not by any means work all that time. Besides the half hour allowed for lunch, there was often a good deal of time to wait while the machines were being repaired. A "drag" took twenty minutes to repair and serious trouble longer. Several stops were sure to happen. The machines always ran badly after midnight, she said, but denied that the

trouble came from the carelessness of the operators. Nevertheless she admitted that it was so hard for her to keep awake that she had to sing and sometimes shout to prevent falling asleep. Workers on the day shift often complained that because of the careless use of their machines by workers on the night shift, they were forced to waste time and thus lose pay while repairs were being made.

A problem of domestic arrangements, arising from night work, had been temporarily solved in a large family consisting of a man and his wife, Mr. and Mrs. B. (both working in munition factories), their four children, Mrs. B.'s sister-in-law (also a munition worker), the latter's three-year-old son, and a man lodger. The two women divided the care of the house and children. Mrs. B. worked from three in the afternoon until eleven, while her sister-in-law's hours were from seven in the morning until three. "Of course, we don't get much chance to talk things over," Mrs. B. said, in speaking of her sister-in-law, "unless I can slip into her room at the shop before she goes off at three, and then I can tell her what I want the children to have for supper. She's nearly always in bed when I come home at night." The story shows the abnormal effect of night work on family life.

The only workers to whom the night shifts seemed acceptable were married women who wanted to take advantage of the chance to earn good pay in "the shops," as the cartridge factory

was usually called, but who had homes and families which needed their care during the daytime. Of course, the household duties were neglected, while the mother was making up her lost sleep. Sometimes older children had to bear the brunt of the housework and take care of the younger children besides. One little girl of eleven whose mother worked on an all-night shift swept the rooms, washed the dishes and took charge of three younger children, including a baby of two years, while the mother slept. In spite of the industry of the young caretaker, the house was dirty and the children sickly looking and peevish.

Night work for women, a ten-hour day, and a fifty-five-hour week were all permitted under the laws of Connecticut at the time of this investigation.* In 1913 a bill had been passed aiming to prohibit night work in factories. The paragraph concerning night work read as follows:

> No person under sixteen years of age shall be employed in any manufacturing or mechanical establishment after six o'clock in the afternoon; and no such minor shall be employed in any mercantile establishment after six o'clock in the afternoon on more than one day in each calendar week, except during the period from the seventeenth to the twenty-fifth day of December of each year; and no such minor and no female over sixteen years of age shall be employed in any such establishment after ten o'clock in the evening.

* This fact remains true as the report goes to press. Bills prohibiting night work for women were proposed during the session of 1916-17 in the Connecticut legislature, but they failed of passage.

Time and the coming of the war showed that the intention of the law was better than its wording. Note the phrase "such establishment" in the last clause in the singular. "Obviously," said the opponents of the measure, "it refers to a mercantile establishment, just mentioned, and not to a manufacturing and mechanical establishment in the more remote clause. Moreover, even if you think it includes them both, it only prohibits work after 10 p. m. At midnight a new day begins and the law says nothing about the hour in the day when a woman may begin work. Presumably she may begin when the clock has stopped striking twelve at night." Taking advantage of this defect, the munition companies, while awaiting a court decision to show whether the law applied to them at all, decided to obey its strict letter but to avail themselves of its inexactitude. Girls began work at 6 p.m. on the night shift. At ten they stopped in accordance with the statute designed to protect them. For two hours they were free to amuse themselves in the factory. At midnight they began work again, not to be released until six in the morning. Several of the women interviewed had worked on this shift. They stated that all the women on the shift were greatly fatigued, and one of them said that she had seen girls fall over on the floor asleep at their work.

It was the judge of the court of the town of Killingly who made unnecessary this complicated observance of law by declaring that the prohibition of night work applied only to mercantile estab-

lishments and not to factories, and thereafter nothing prevented the continuous employment of women at night in any factories in the state.*

The neighboring states of Massachusetts and New York prohibit night work. In New York state the highest court in 1915 reversed its own earlier decision and declared that the evidence then before it showed that it was in the interest of the public health and morals to insure for women a period of rest at night.

In its official position toward night work the United States has a lesson to learn from England. In the early days of the war England, as has been indicated, set aside the labor laws in order to expedite the production of munitions of war. Excessive hours of labor, night work and Sunday work became common in the English factories. In spite of the patriotic fervor with which English women entered the workshops and undertook the manufacture of munitions, fatigue accumulated with the long hours and hard work. The output became unsatisfactory in quantity. At last government officials, facing the fact that the end of the war was likely to be very far off, and realizing that England's working force must be conserved for a long period of time, took up the problem from the angle of health as well as of productivity. In September, 1915, a committee was appointed under the Ministry of Munitions "to con-

* State vs. William Fittz. The decision was handed down October 31, 1914, in the Town Court of Killingly, Conn., by Judge H. E. Back.

sider and advise on questions of industrial fatigue, hours of labor and other matters affecting the physical health and physical efficiency of workers in munition factories and workshops."*

In the United States, in the workshops in which vast amounts of war materials are being manufactured for the same conflict, no governmental review has been made of the new industrial conditions, except a study of occupational diseases due to work on munitions conducted by the federal Bureau of Labor Statistics.† Up to this hour manufacturers here have been turning out goods under conditions of work declared wasteful by the English investigators. Employers have argued that to work women as well as men at night was the only way to reduce the cost of maintaining the plants in order that they may yield a maximum profit, and for the same reason Bridgeport employers seem to be lengthening daily hours. With the nation's new responsibilities, with food likely to be higher, with men workers in factories likely to be fewer and with women assuming some of their tasks, there should be no further delay in getting full information about the extent and effects of night work in munition plants all over the country, the length of day and night shifts, the provision for rest periods and the safeguards against accidents and industrial poisoning.

* The reports of the Health of Munition Workers Committee are summarized in the second part of this book, pp. 97-137.

† U. S. Bureau of Labor Statistics, Bulletin 219. Industrial Poisons Used or Produced in the Manufacture of Explosives, by Dr. Alice Hamilton. Washington, 1917.

CHAPTER V

WAGES

ALTHOUGH rumor exaggerated the pay actually received, wages in munition factories in Bridgeport were in fact distinctly higher than the old rates for unskilled operatives in Connecticut's principal industries before the war. The reason is easily explained. The munition factories were obliged to enlarge their plants. The working force had to be greatly increased, and it must be done quickly to fill the urgent war orders. The offer of higher wages was necessary not only to attract employes away from other industries in Bridgeport, but to bring in recruits from other communities. The effect on workers, on other industries, and on the standards of the community itself is an interesting chapter in social economy. It should be remembered that the sudden expansion followed a period of depression. When the boom did come, it took no vivid imagination to arouse in the workers a desire to share in the expected windfall, especially as it followed a period of dearth.

Some of the old employes of the cartridge factory were jealous of the newcomers who had not served their apprenticeship of low wages, but on the whole, the prevailing spirit was a good humored wish to let everybody have a share. This was well expressed by an Irish girl who had

worked for twenty years in the cartridge factory and was contented with the $8.00 wage which she had earned at labeling. "O' course it's true that the new girls that's comin' in make as much as me who's been in the place comin' twenty years. Some there is that take that as a cause o' complainin'. Some there is that ain't satisfied with anything the good God gives them. I say to myself, 'If I'm all right why not let the ithers in on the good times too?' "

Employers in other industries were forced into severe competition for labor, and some of them tried to point out to prospective employes the superior advantages of a normal trade over a war boom. The alluring advertisements which appeared in the daily newspapers at the time told the story of the acute labor situation. One factory advertised:

WANTED
Men and Women for Factory Work
HIGH WAGES PAID. WORK GOOD AND STEADY

Another advertisement ran:

WANTED—GIRLS
On Power Presses, Tapping Machines and Light,
Clean Assembling.
HIGH WAGES PAID TO BEGINNERS.
8 Hour Shop.

Others were:

WANTED
A few A-1 Machinists, 48-Hour Shop
Saturday afternoons off.

STEADY WORK FOR GOOD MECHANICS

Excellent opportunity for skilled men to earn increasing bonus.

THIS IS NOT A WAR BOOM
OUR INDUSTRY IS CONSTANT.

Altogether, an outsider would probably have concluded that for labor Bridgeport had become an El Dorado. Manufacturers gravely commented on the independence of their employes due to the abnormal demand for their services. "If you don't like the way I work I can leave and get a job at the munition shops," was said to be the retort of the employe whose work was criticized or whose demands were refused. Housewives saw in the situation a new explanation of the chronic shortage in domestic servants. The older inhabitants regretted the influx of "foreigners," the increasing number of arrests, and the growth of cheap amusement places, and predicted dire consequences to the morality of the city. Citizens commented on the effect of the "fat pay envelopes" on the working people. "They don't know what to do with their money," said a Bridgeport manufacturer in speaking of the higher wages that "good times" had brought to his employes.

Yet the statistics of the weekly earnings of women as shown in Table 10 do not give the impression of an abnormally high rate of pay.

TABLE 10.—WEEKLY EARNINGS OF WOMEN MUNITION WORKERS INCLUDED IN THE INVESTIGATION

Weekly earnings	Women	
	Number	Per cent
Less than $8	1	.6
$8 and less than $9	17	10.4
$9 and less than $10	20	12.2
$10 and less than $11	45	27.5
$11 and less than $12	16	9.8
$12 and less than $13	40	24.4
$13 and less than $14	15	9.1
$14 and less than $15	5	3.0
$15 and less than $16	4	2.4
$16 or more	1	.6
Total	164[a]	100.0
Median weekly earnings	$10.97	

[a]Information as to earnings is not available for one of the 165 women included in the investigation.

Only one of the 164 women whose earnings are given in Table 10 earned less than $8.00 a week as a rule, but half the workers earned less than $11 a week. The exact median earnings were $10.97. Six-tenths of one per cent earned $16 or more.

These wages were undoubtedly high when compared with the low level generally prevailing for women in factories. In 1913 a special commission which had been appointed to investigate the condition of employment of wage-earning women and minors in Connecticut, made its report to the legislature. Their data on wages showed that in that period, just preceding the war, the median wage for women in the cotton industry was $9.57, in the manufacture of silk $7.65, in the making of corsets $7.87, in the metal trade $7.43, and in

manufacturing rubber $7.56.* No data are available to show what wages were paid in the cartridge factory in 1913, but the general testimony indicates an increase after the war began. Whether or not workers were actually better off in 1916 than before the war can be ascertained by considering wages in comparison with the cost of living. The inroads made by soaring rents and the rapidly rising cost of food and other necessities are discussed in the following chapter.

New girls were generally paid a fixed day rate until they learned how to do the work, but except for this brief period the majority were paid on a combination time and piece basis. A flat day rate was paid for which a specified output was required and which became in effect a guaranteed minimum. For production beyond the requirement, payment was on a piece basis so that a premium was placed on large output. Some workers, however, were paid altogether by piece rates while some few others such as stock girls and instructors were regular week workers. In some departments, however, according to the girls' statements, no girl was allowed to make more than a fixed sum. In the summer of 1915, when many departments of the cartridge factory organized the work in three shifts, beginning at 7 a.m., 3 p.m., and 11 p.m. respectively, a simultaneous advance was made in piece rates, making it usually

*State of Connecticut, Report of the Special Commission to Investigate the Conditions of Wage Earning Women and Minors in the State, 1913, p. 36.

possible to earn as much in eight hours as had been earned formerly in ten. For night work a small bonus was customarily paid.

Apparently the increases were not so great for the clerical force. In one establishment an official stated without qualification that the factory force was better paid than the office. A girl who was earning $11.50 a week heading shells spoke regretfully of the sacrifices her family had made in taking her sister out of the factory and giving her a stenographer's training; for the sister, back in the shops as a stenographer, was earning only 50 cents a week more than the girl in the factory who told the story.

As in the gaining of the eight-hour day, the real test of the new standards secured for labor by the sudden growth of an industry is their permanence. When once the larger force was organized, the eight-hour day was gradually lengthened. So, during the summer of 1916, the management appeared to be engaged in a policy of reducing rates of pay. "We used to get 12½ cents a thousand," said an inspector, "and that certainly did make slick pay for a girl. But now they only give us nine cents for the same work." Even where piece rates were not reduced the tremendous speed at which the machinery was driven, according to the testimony of many of the girls, so injured the machines that they could not turn out as much as they used to. The continual stoppages for repairs made big inroads on the workers' earning time.

Three munition workers in one family ascribed

their decreased piece rates in the factory to the competition of foreign girls. It seemed probable that other factors were the desire of the management to cheapen the cost of production and the inability of the workers to maintain the standard of wages which had been won merely by the force of circumstances.

The results of good pay are seldom questioned, especially by the people who receive it; but in the case of the women munition workers of Bridgeport, it has already been made clear that serious issues have come up along with the high rates of wages. In an attempt to fill the large war orders as fast as possible, women have been induced to work long hours and at night, and have been put to work near or with explosives in ways which sometimes mean accident, industrial poisoning or other illness.

It must not be forgotten also that along with the good luck of the workers strong enough to meet new demands for speed in industry, may go increased distress for those members of the community unable to compete with the young and the vigorous. In the annual report of the Board of Public Charities of Bridgeport for 1915-16, occurs this significant paragraph:

> While a general increase in wages resulted from boom conditions, yet the widowed, the physically handicapped and the inefficient suffered. In the rush the poor were institutionalized, while the border-line cases were submerged.

Higher wages brought about through a general

leveling up of industrial standards are beneficial, but higher wages due to a temporary boom are sometimes danger signals. Their advantages may be offset by a strain easily endured for a time, but which in the long run may undermine the health of workers and change the character of the community. High wages lasting only a brief time are not sufficient compensation for lowered standards in the other conditions of work.

In addition to wages that permanently insure the fundamentals of life, and shop conditions that insure the welfare of the worker, there are other needs such as those of education and health protection, transportation, and housing, which must depend upon the collective resources of the community. Bad housing, disregard of law and order, the breakdown in civic responsibility jeopardize the morale of a modern industrial town. Thus the industry which through too rapid growth has bewildered civic consciousness and rendered municipal resources inadequate must be judged not merely by its high wages, but by the sum total of its influence on standards of living.

CHAPTER VI

THE WOMEN AT HOME

THE effect of a sudden overgrowth of population on recreation, education, transportation, and especially housing, was clearly pictured in the homes of munition workers. It was impossible for lack of time to make a detailed budget study. Nevertheless facts about the great difficulty workers had in finding a place to live and the rapid rise in rents, and comments on the increasing cost of other necessities, showed that its industrial expansion had brought to the city large problems not to be solved by individual action. In so far as the households of the 100 girls living at home may be considered typical, the incomes of the families of munition workers were relatively high. It is safe to assume that as a rule their incomes should have made it possible to secure comfortable and healthful living conditions. But even though many of the families interviewed earned much more than the amounts which are usually described as "living wages" they often suffered from a lack of housing accommodations, and of educational and recreational facilities.

Weekly family incomes ranged from $10 a week to $60 or more. Table 11 shows the significant fact that in the group of 86 families who gave full information concerning their earnings, only 27 had weekly incomes of less than $30. These

TABLE 11.—TOTAL WEEKLY INCOME IN FAMILIES OF WOMEN MUNITION WORKERS INTERVIEWED, BY NUMBER OF CONTRIBUTORS

Weekly income	Families having					All families
	1 contributor	2 contributors	3 contributors	4 contributors	5 contributors	
$10 and less than $15	4	3	..	..	..	7
$15 and less than $20	1	..	..	..	..	1
$20 and less than $25	..	10	2	..	..	12
$25 and less than $30	..	6	1	..	..	7
$30 and less than $35	..	4	5	1	..	10
$35 and less than $40	..	2	2	1	..	5
$40 and less than $45	..	2	7	1	1	11
$45 and less than $50	..	..	7	2	1	10
$50 and less than $55	..	..	5	3	1	9
$55 and less than $60	..	..	..	2	..	2
$60 or more	..	..	3	3	6	12
Total	5	27	32	13	9	86[a]

[a]Of the 100 families for which records were secured, 14 did not give complete information on family incomes.

were all families with not more than three wage-earners. The highest incomes were made possible by the combined contributions of several workers. Exceptional even among the 12 families whose weekly incomes are in the highest class were the M's. The high wages of the four working sons and daughters added to the father's earnings as a machinist, totalled more than $4,000 a year, when they were all working steadily. They made a picture of normal, happy family life, with the mother caring for the household, and the two youngest children in school. They lived in a large, comfortable house, with a fruit and vegetable garden beside it, and all the signs of prosperity were in evidence.

Another family group with a yearly income of over $4,000 was made up of three generations:

a widow, her four children, two of whom had married and come home to live, and her two grandchildren. Five of the family were wage-earners (three in the munition shops), and the widowed mother added to the income by subletting rooms in an adjoining flat.

The women munition workers showed themselves to be generous contributors to the family income, as Table 12 shows.

TABLE 12.—PROPORTION OF WEEKLY EARNINGS GIVEN TO THE HOME BY WOMEN MUNITION WORKERS INTERVIEWED WHO WERE LIVING WITH THEIR FAMILIES

Per cent of earnings given to home	Women
Less than 25	1
25 and less than 50	15
50 and less than 75	22
75 and less than 100	10
100	49
Total	97[a]

[a]Of the 100 women interviewed, who were living with their families, two did not give information on this point and one reported only irregular contributions to the home.

Almost exactly one-half of those who reported on this point turned all of their earnings into the family purse. Many of the younger workers seemed to recognize an unquestioned filial duty in giving their pay envelopes unopened to their mothers. On the other hand, the dependence of many of the families upon the women workers gave them an important position in directing family life. Even young girls, on account of their earning capacity, had a controlling hand in making family plans.

An example of the importance of the woman's

contribution to the family income is seen in the eventful history of a young English couple. The husband had come from England to Bridgeport eight years before, and sent for his wife and child to follow him. Hard times soon came, and his wife told of the terrible days when her husband could get only two or three days' work a week, and when they had to make the pay of $4.50 cover the week's expenses for themselves and their baby, with the added anxiety about how they could manage when the next baby came. The hard times passed, but after two more children were born the husband again found himself unable to provide for all their wants. He was not a skilled workman, and he began to fear that his wages could never keep pace with the increasing family demands. His wife came to the rescue, and while she was earning $9.00 a week on the night shift he was advancing from the work of a machinist's helper by a series of regular promotions which would eventually bring him a position as a machinist. In the meantime, by using their joint earnings, they had been able to move into one of the company's new apartment houses, where they were enjoying the hardwood floors, bathroom, set tubs, electric lights, and gas for cooking. "It's 'eaven compared with the old place we used to live in," said the wife.

The pretty young bride of a recently appointed officer on the police force had left the factory when she married, but her "boss" sent for her to come back, and on account of the good pay she

returned. The weekly income of more than $30 permitted the couple to live comfortably in a flat so neat and orderly that it might have passed for a model in an exhibition. Cut glass shone from the sideboard, and even the floor was polished. Mrs. B. said that she and her husband took turns by weeks in keeping the floors in order and in doing the heavy cleaning.

The facts about income have already shown that in the majority of families reporting on this point three or more wage-earners contributed to the maintenance of the home. As a rule the munition workers belonged to fairly large families. The average number of members, in the 100 families investigated, was 5.1. Two families had 14 members each, but with these exceptions the family groups were composed of not more than 12 persons. In many of the smaller families no male wage-earner was found. The age and sex of the wage-earners are shown in Table 13.

Eighty-nine per cent of the male heads of families, 100 per cent of other males sixteen or over, and 68 per cent of the women sixteen or over, were at work when the investigation was made. Only five out of the 15 children between fourteen and sixteen were at work, a fact which may be partly accounted for by the lack of demand in the munition shops for children of those ages. None of the children under fourteen were at work. Of the 286 wage-earners sixteen or over in these families, 179 or 62.6 per cent were employed in munition shops.

TABLE 13.—PERSONS GAINFULLY EMPLOYED AMONG MEMBERS OF 100 FAMILIES OF WOMEN MUNITION WORKERS INTERVIEWED, BY AGE AND SEX

Age and sex	All persons in families	Persons gainfully employed	
		Number	As a per cent of all persons
Male heads of families	61	54	89
Other males 16 years of age or more	58	58	100
Females 16 years of age or more	256	174	68
Children 14 years of age and less than 16	15	5	33
Children less than 14 years of age	120	..	..
Total	510	291	57

The advantages of the comparatively high incomes brought in by the employment of so many wage-earners in each family, were in part offset by the conditions of living. The families of munition workers were quite ready to talk of the soaring rents. In some cases it had meant the hardship of family separation. One widowed mother who worked on the night shift in the shops was not able to keep her home for her four children. Three of them were put in an orphan asylum, and she took the youngest with her and went to board with a relative.

Stories of the hardships of the rent situation found their way into the papers. They told of one woman with six children, whose husband had recently been moved to a sanitarium and who complained to the city clerk that her rent was raised from $17 to $18, the next month to $19, and two months later to $24. When she made the com-

plaint she had just been notified that the rent was about to be raised once more. Another tenant, living in a four-room apartment in a three-family house, was ordered out because he could not afford to pay $25 a month. Within seven months the rent had already been raised from $16 to $20. The three large families in the house were compelled to use one toilet, and there were no bath tubs or wash tubs in the house.

Even a long record as desirable tenants often did not free a family from the rent-raising bugbear. An English-born mother and daughter had lived for twenty-five years in the same house, and had the pride of long possession in their flat. The mother had also been a munition worker in her youth, and remembered the founder of the shops. It was distressing to have a speculator buy the house and raise the rent from $12 to $14, and later to $16. It was then sold to an Italian with the understanding that the rents were $18, and naturally the new owner insisted upon having that amount paid.

At one time it was rumored that landlords were very generally refusing to take families with more than one child, and even a family composed of two or three adults found it hard to get a "rent." One young married couple, with an income of $18 a week from the husband's work as loader at the cartridge shop, could not find a flat they could afford, and lived for the first months of their married life in one room, with the furniture they had bought for their new home stacked about them.

One family was found in utter despair. The house in which they lived was to be sold to a Hungarian who could not speak English. They were obliged to move. The old mother, when interviewed, had just returned from a search for a rent. She had first hunted in the neighborhood in which they had long lived with their friends, and where they wished to remain. Failing to find anything there, she had searched the city and finally gone to look at the company houses, but the only apartments for rent there rented for $35, a sum entirely beyond the means of a family in which the three young daughters were the only wage-earners. They would have to "clear out" in a few days, and the chance of finding anything they could afford seemed small.

Another family which had been living in one of a group of rather decrepit four-family houses on the outskirts of the city, had its rent for five rooms raised within a year from $8.00 to $16.00. This family found that the way out was to move to one of the nearby beaches, preferring a small cold beach cottage to the struggle for space in the city. Other families also solved the problem in the same way. In the fall of 1915, when people who had been staying at the shore for the hot months attempted to return to the city, rooms were so hard to get that many decided to stay where they were. They put up extra stoves in the flimsily constructed cottages and shacks and prepared to spend the winter months at the shore. The season was a severe one and they suffered from

cold. But the frequent snow and ice, the lack of proper sanitary and heating arrangements and the long car ride to their work, were not the only drawbacks to healthful home life. The usual cheap summer amusement places still flourished and exercised distinctly undesirable influences.

Not only did the old residents of Bridgeport suffer hardships from the housing shortage and the boom in rents, but newcomers found it difficult, if not impossible, to secure living quarters. Many stories were told of men who had come to work in the munition plants, but who after a short stay had been forced to return because they could find no home to which they might bring their families.

Bridgeport is proud of her tree-lined streets on which are modest one- and two-family houses, set back from the sidewalks, in yards many of which contain good-sized grass plots, hedges, and trees. Some of these houses are owned by the families who live in them, people who regarded themselves as fortunate when they saw their neighbors forced to leave their rented homes and go to live in the crowded three-decker wooden tenements permitted by the old law. The building code of 1915 forbade the construction of the latter type, but just before its passage row after row of flimsy structures was erected, to accommodate from three to 12 families in each building. The foreign-born people were usually found in the neighborhoods where the three-deckers abounded.

The tendency of the one-family house to give way to the multiple dwelling was exemplified in a comparison of the types of houses occupied by the 100 families of munition workers investigated. Only 24 families lived in single houses. Twenty-seven of the remaining 76 families lived in two-family houses, a type now common in Bridgeport. Almost all of the other families were in three-, four-, or six-family houses.

Twenty-three of the 100 families owned their homes, and in some instances they held other property besides. A German family valued their seven-room house at $4,500 and were waiting to sell it for that amount so that they could move to a 260-acre farm which they owned in the nearby country. A mother and daughter had divided their old homestead into four apartments, keeping one for themselves.

Table 14 shows the rent paid by the families of munition workers interviewed.

Within the city itself all available accommodations were made use of, and munition workers were found living in every section. (See map showing location of homes of women munition workers, frontispiece.) The rent paid varied with the locality, the type of house, and the number of rooms occupied. The majority of the 100 families were living in rented houses or flats. In more than one-half of the rent-paying families the amount paid per month was $16 or more. As a rule families occupied at least four rooms. Four families had houses of 10 rooms each, and paid at

TABLE 14.—MONTHLY RENTS PAID BY FAMILIES OF WOMEN MUNITION WORKERS INTERVIEWED, BY NUMBER OF ROOMS OCCUPIED

Monthly rent	Families occupying										All families
	1 room	2 rooms	3 rooms	4 rooms	5 rooms	6 rooms	7 rooms	8 rooms	9 rooms	10 rooms	
Less than $10	1	1	1	1	..	..	..	..	..	..	4
$10 and less than $11	..	..	..	2	2	..	..	..	..	..	4
$11 and less than $12	..	..	..	2	..	..	..	..	..	..	2
$12 and less than $13	..	..	..	2	2	..	..	..	..	..	4
$13 and less than $14	..	..	..	2	..	1	..	..	..	..	3
$14 and less than $15	..	..	..	3	3	..	..	..	..	..	6
$15 and less than $16	..	..	1	2	2	4	..	..	..	..	9
$16 and less than $18	..	..	..	3	4	3	1	..	..	..	11
$18 and less than $20	..	..	..	4	5	..	..	1	..	..	10
$20 and less than $25	..	1	1	1	7	3	..	..	..	1	14
$25 and less than $30	..	..	..	1	1	..	3	..	..	1	6
$30 and less than $35	..	..	..	..	..	1	..	..	..	1	2
$35 or more	..	..	..	..	..	..	..	..	1	1	2
Total	1	2	3	23	26	12	4	1	1	4	77[a]

[a] Of the 100 families for which records were secured, 23 owned their homes.

least $20 a month for rent for the ample accommodations.

Viewed from metropolitan standards the rents cited are perhaps not exorbitant, but for Bridgeport families they were contrasted not with rents in other cities, but with the markedly lower rents of a year before. The most usual increase in the monthly rent was $2.00 or $2.50 in the course of the year, although it ranged as high as $8.00, $9.00 or $10.00 in some cases. Twelve families had had to pay an increase of between 20 and 30 per cent and eight had had their rents raised by 50 per cent or more of the amount which they were paying a year before. The median increase was 22 per cent.

Again and again householders said that they did not dare to ask for badly needed repairs because they feared that their request would only be made an occasion for extortionate advances. The situation was of course hardest on families with high standards of living. "The Italians and Hungarians can stand the high rents because they can crowd together," said one American woman.

With the rapidly increasing rents, overcrowding was inevitable. A Hungarian family of 11 persons, five of them children under fourteen, occupied four rooms in a flimsy "three-decker" in the rear of a dirty court. Another Hungarian family crowded its 14 members into four rooms in still another three-decker. The amount of space per person in the homes of the women interviewed is shown in Table 15.

TABLE 15.—PERSONS PER ROOM IN FAMILIES OF WOMEN MUNITION WORKERS INTERVIEWED

Persons per room	Families
Not more than 1	62
More than 1 and not more than 1 ½	27
More than 1 ½ and not more than 2	9
More than 2	2
Total	100

The heavy demand for houses and the consequent congestion were reflected in the fact that 11 families were living under such crowded conditions that each family averaged more than one and one-half persons to each room.

Clearly Bridgeport was not an Arcadia for the hundred families studied in this investigation. Although they represented high incomes as well as low, increased rents and high prices absorbed much of the surplus in even the well-to-do families.

While the more prosperous families were able to give their children business or high school training some of the poorer ones were barely able to provide the necessaries of life. In other instances they failed to do even that and were obliged to resort to public charity. This was the case in certain families who had no male wage-earner.

Each month it became less possible to pare down other items in order to pay the high rents, since all the necessities of life were becoming more expensive. Less meat, less bread, less milk were to be had for a dollar than formerly. "New York has nothing on us for high prices," said a woman

who kept account of her daily expenses and had just compared it with her brother's in the larger city. "The prices here in Bridgeport are something fierce," was the comment of a loader who had only himself and his young wife to provide for. "Only four days ago I brought home $20 which should have lasted a week. Now there's only $2.10 left."

High prices were reflected not only in the stories of girls living at home, but affected also the women who were boarding or living away from their families.

Alice had been a salesgirl in a Massachusetts city for six years before she decided to come to Bridgeport in 1915 to work in the cartridge shops. Here she earned $11 a week, paid $2.50 a week for her room and took her breakfast and supper at a nearby boarding house. Her expenses for lodging and food, including her lunch, came to more than $6.00 a week. In her opinion with the cost of clothes, carfare, washing and all other necessities, no girl could live in Bridgeport on less than she made.

Mary was a frail woman of forty, quite alone in the world, who rented a five-room apartment and to meet the cost of living sublet three of her rooms to lodgers,—three men and three women. When visited, she was recuperating from a serious illness which still, after four weeks at the hospital and at home, had left her too weak to return to work. Though her earnings as a rule came to $10 a week, without the income from her

lodgers she could not have made both ends meet during her sickness. The $10 a week when she was well did not permit sufficient savings for illness.

Mrs. P. had been forced to go back into the factory after she had divorced her husband. For $3.00 a week she rented a furnished room from a woman who allowed her to prepare her own breakfast and do some laundry work in the kitchen. She bought her supper in a restaurant where one could get a "real good meal" for 25 cents. She made $13 a week and was able to save for the rainy day which she believed was sure to come.

Mrs. S. was a capable worker of more than fifteen years' experience in munition making. She began work at sixteen and except for the brief interval of her married life had been working ever since in several different departments. She had no dependent persons to care for and had found a comfortable home with friends who lived in an attractive new house near one of the parks. For this she paid $5.00 a week. Her regular $13 a week for instructing the young inspectors gave her security and enabled her to put by a little each week after she had paid for her board and other expenses.

Helen was a girl of nineteen who, left alone in the world by the death of both parents, had been at work ever since she was fourteen years old. For nearly four years before she went into munition making she had worked in a novelty and paper box factory, never earning more than $7.50 a

week. During the year in which she had been in the shops her wages had increased from $7.85 to $10 a week. She inspected paper shells, an occupation which she said was a strain for girls whose eyes were not strong. She spoke enthusiastically of the shops and said that the foremen were especially considerate of girls whom they knew to be alone and dependent on themselves. She was boarding with a friend whom she had known for a long time and therefore paid only $4.00 a week for board.

It is not surprising that some of these workers should have been able to live on a lower wage than others. On the whole, however, for girls away from home, $10 or $11 seemed to be necessary for a fair standard, unless a girl lived with friends who gave her board and lodging at less than commercial rates. At $13 saving was possible. It should be recalled that half the women workers investigated earned less than $11.

The effect of rising rents and overcrowding on the burden of poverty in Bridgeport is reflected in the annual report of the Board of Public Charities for 1915-16.

> The overcrowding of homes has been the outstanding feature of the year's events in Bridgeport. The effects of this condition have manifested themselves in problems of (a) immorality and illegitimacy, (b) the sheltering of evicted families in institutions pending adjustment, (c) increased hospital care.
>
> The abnormal inflation of rent values caused much misery. It was formerly possible to find a fair rent for

$12. Rents sometimes doubled in value as the demand increased. Wholesale evictions of the poor followed. Families were broken up. Children were placed in institutions. Attendant upon this was the loss of home ideals and standards.

The report of the city physician for the same year gives similar testimony.

Too many people are living in inadequate homes, sleeping spaces being limited, houses too closely built, shutting out light and air and resulting in poor ventilation and sanitation. Basement rooms are copious breeders of state and city charges. Landlords rent these rooms in order to make real estate pay and care little for the general welfare and the city's health.

Room congestion is a prolific source of trouble. Bear in mind that twenty-five per cent of the tubercular cases come from homes and rooming houses that are classed as overcrowded. Of course, poor housing and overcrowding are not being set forth as the only cause of tuberculosis; nevertheless, they have an important bearing upon the matter, and are the contributing factors that we can help remove and control—and, therefore, are subjects which we should have seriously in mind with a definite objective viewpoint.

To accommodate the increasing number of girls in the munition plants, three large buildings of the dormitory type were started by the Remington Arms-Union Metallic Cartridge Company. The plans provided for excellent construction and the buildings have a commanding site overlooking the city, but construction was greatly delayed. Not until March 23, 1917, was the first of these

dormitories opened for occupancy, and at that time work was still to be done before the full quota of 127 girls could be accommodated. By the end of May, 1917, 75 women workers were living in the one dormitory, which even then was not quite completed, while the other two were still in the hands of carpenters and plasterers. The buildings are three stories high, of fireproof construction and attractive appearance. There were a large number of double rooms for which each of the two girls who occupied them paid $2.00 a week. Single rooms might be had for $3.00, and space in an open dormitory on the top floor for $1.75 a week. These rates included light, heat, bed linen, and towels, and care of the room. Each room had a built-in wooden wardrobe, and metal lockers were provided in the open dormitory. The rooms were neatly furnished in gray "cottage" furniture —a chiffonier with mirror, a writing table, a chair, and a couch bed. The walls were untinted white plaster, which gave the rooms a rather bare look, but the two windows which were found in most of them provided abundant sunshine and air. Each floor had two lavatories, each equipped with one bath, one shower, two toilets and six wash basins. In the basement was a cafeteria where breakfast and dinner were served at moderate rates. Lunch would be "put up" for those girls who wished to take it with them to the factory. A "fudge kitchen" on the second floor, reading and reception rooms with magazines and Victrola on the main floor, and a room for dancing

in the basement which was equipped with a piano were provided for recreation. There was also a laundry in the basement for the use of the girls.

The efforts of this one company as early as 1916, however, were seen not to be sufficient, and it was clear that in the interest of public health some action by voluntary associations or by city or state would be needed.

CHAPTER VII

PROGRAMS OF CITY AND STATE

THE facts of this investigation show what may happen as the result of a rapid expansion of any industry in any community at any time. When a national or an international crisis brings the need and the incentive for maximum production the tendency is to lower the standard of working conditions, in forgetfulness of the crucial fact that the conservation of the health and freedom of the workers is a fundamental necessity for the nation. Even the desire for maximum production cannot be fulfilled if the workers' strength be undermined. This is not theory. It is based on observation and experience and is poignantly illustrated by the sobering results of England's experience in the present war.* Night work for women, long hours by day, fatigue with its insidious effects on the powers of resistance to disease, speed and strain, a sudden growth in population, difficulties in transportation, inadequate facilities for recreation, congestion and overcrowding in the homes of the people, with their inevitable results in disease and immorality, lowered standards of living with rising costs,—these are the conditions from which Bridgeport has suffered. Since this investigation was completed they have become, not a possible future local problem of certain industrial centers, but a present condition of conse-

* See Part II, pp. 97-145.

quence to the whole nation. Everywhere, in the papers, in the legislatures, in workingmen's bodies, and in welfare associations of citizens the question is being discussed: "How can we maintain maximum production at the minimum human and social cost?"

How Bridgeport as a city has met its new industrial and civic conditions should, therefore, be set down as a practical guide for other communities.

In the old days, under the old order, as in most American towns, Bridgeport merchants and manufacturers went their several ways intent on making and selling goods, leaving to the mayor and the board of aldermen and the party bosses behind them all concern for the housekeeping of the city. But the new and unique conditions roused a new spirit. The merchants and manufacturers, the educators and the physicians, the Chamber of Commerce, civic and philanthropic associations united for action. They got expert advice and went to work. They found that they had to grapple with fundamentals. It was like building the city over again. It needed sewers and bridges. The citizens needed pavements on which to walk, cars in which to ride. The children needed schools and parks. Workers needed houses and the sick better hospital care. Money had to be got to do these things. The first step, therefore, was to appropriate funds. In April, 1916, a proposition providing for the largest bond issues in the history of the city was submitted to

the voters and carried. The issues provided for were as follows:

Purpose	Amount
Pavements	$ 500,000
Schools	300,000
Sewers	500,000
Bridges	250,000
Police and Fire Departments	125,000
Public clinic	75,000
Parks	275,000
Street extension	250,000
Total issue	$2,275,000

A recreation commission was appointed which looked beyond the enlargement of the beautiful park along the Sound and the smaller parks throughout the city and undertook the big problem of all-the-year-round recreation. The crowds of young men and women who loitered along the streets when the working day was done, the lines stretching a block in either direction waiting to get into the overtaxed movies, the throngs rushing for cars to take them to the nearby beaches, these were the people who made urgent better recreational opportunities of the city. The commission obtained expert assistance, securing a representative of the Playground and Recreation Association of America to survey the situation in Bridgeport and to give advice.

Behind the appointment of the recreation commission was the report of the vice commission,

which had laid bare some of the secrets of the underworld, and had strongly urged the appointment of a body to provide opportunities for healthful amusement and exercise.

In the early summer of 1916 the vital question of public health forced itself upon the attention of the city. Cases of streptococcic infection, attributed to the milk supply, spread alarm throughout the city, and brought forth determined efforts to locate the source of the trouble and to secure clean milk. Closely upon this followed the danger of an epidemic of infantile paralysis, which was rife in New York City. No time was lost in securing the services of an expert. Dr. Abraham Sophian, of the Rockefeller Institute, was put in charge of the work of the Board of Health in the summer of 1916. Protective measures were at once enforced and it is believed that the prompt and thorough work of the department saved the lives of many children.

Another far-reaching benefit to the city came from the general clean-up and the educational health work done by the inspectors and visiting nurses of the Board of Health. The daily press of those weeks reflected the citizens' growing appreciation of the need of adequate protection of the public health, and the sum which was voted in April, 1916, for public clinics is now considered inadequate for the up-to-date out-service work which is planned to supplement hospital care.

Nothing better illustrates the new spirit that captured the city in 1916 than the Minerva-like

appearance of its life-sized Chamber of Commerce, which undertook a program for providing houses in which working people could live comfortably, terminal and track facilities to accommodate the enormously increased freight traffic, and street extensions for the crowded thoroughfares.

The housing campaign was the most vigorous undertaking of the Chamber of Commerce. Its members believed that the filling of this need was the key to the continued prosperity of Bridgeport. Long before the influx of labor and the demand for house-room had disclosed its insufficient resources, it had become clear that the city was not immune from the common housing problems of our eastern manufacturing centers. The Bridgeport Housing Association had been formed in 1914 to make a serious study of the situation and to set its dangers before the eyes of the public. Under the auspices of the Association, Miss Udetta D. Brown made a study of three districts of the city in March, April, and May, 1914, the results of which were published by the Association in a small volume entitled A Brief Survey of Housing Conditions in Bridgeport, Connecticut. The report dealt mainly with construction, fire protection, sanitation and maintenance, and concluded with the recommendations that such a service as that of visiting housekeeper should be provided, that vacant yards should be transformed into gardens, and that a housing company should undertake the building of good small houses. In addition it recommended that the city should require the record-

ing of vaults and cesspools, collect ashes and rubbish, extend the sewers, provide additional inspectors, establish a city code, and strengthen existing provisions.

Largely as a result of this investigation and of the continued activities of the Bridgeport Housing Association in carrying on a publicity campaign, a new code was adopted in the spring of 1915, containing an important provision aimed at the common three-decker tenements. The restriction was as follows:

No frame building shall be hereafter erected or altered over two stories in height, or to be occupied by more than four families. But nothing herein shall be taken to prevent the construction of blocks of frame buildings separated by fire walls as specified in this Code.*

This section has since been modified to permit raising frame buildings on a brick foundation, by adding the following provision:

Nor shall this ordinance be construed to prevent the raising of any two-story frame building heretofore erected by constructing thereunder a first story of brick when the proposed plan of alteration complies in all other respects with the ordinance of this city and will not in the opinion of the Board of Building Commissioners, if carried out, endanger the public safety; and provided that in no case shall the first story in any building so altered be used for dwelling purposes.†

As already described, the demand for labor in

*Building Code of the City of Bridgeport, Chapter XIII, Section 233.

†Amendment of March 20, 1916.

1915 gave a different aspect to the housing situation. Even had the extensive system of company houses started by the Remington Arms-Union Metallic Cartridge Company been completed the whole number would have been only a fraction of that required.

When the Chamber of Commerce undertook its housing campaign in 1916, it sent representatives to study housing projects in other cities, and charged them to distinguish paying investments from the "fancy" experiments of semi-philanthropic agencies. Bridgeport meant to conduct her municipal business efficiently and in a business-like way. The services of Mr. John Nolen, city planner, were secured, and the housing committee of the Chamber of Commerce proceeded to act on the recommendations given in the report on local housing conditions prepared by him, and submitted in August, 1916.

Mr. Nolen stated that the situation in Bridgeport was "desperate" and recommended the organization of a house building company as "the only good solution of the problem." The Bridgeport Housing Company was formed, capitalized at $1,000,000 and backed by several of the most prominent and public-spirited citizens in the city. The plans called for houses to accommodate 1,000 families, with rents ranging from $15 to $25 a month.

Bridgeport's awakening had found its way into advertisements which had appeared during the spring in the papers in the name of the Build for

Bridgeport Movement. A number of the exhortations follow:

GET-TOGETHER WEEK

We are waking up in Bridgeport. Some of us are a little dazzled by seeing what was before our eyes all the time.

A lot of us are asleep, yet a sort of restless, active, hypnotic sleep, caused by keeping our eyes fixed on the next dollar in front of us.

Those who are awake are looking ahead to many more dollars than are now in sight, a steady secure stream of them made permanent by a stable prosperity governed by intelligence, by fair play, by honest work.

We are not going to have this gambler's prosperity handed to us on a silver platter indefinitely. And we can't club it out of each other, when there isn't enough to go round, even if we are silly enough to try it. . . .

Remember always that the value of a dollar isn't measured by the figure 1 with a sign before it. Its measure is what you can get for it, the work you can make it do for you.

The biggest work a dollar can do for you just now is to build homes that will pay.

It is going to take many dollars—all we can spare.

Big men in Bridgeport are giving their brains and knowledge to the problem, and they will lend their money.

They can't do it all. It isn't fair to Bridgeport nor to us to let them do it all. It's part of our job.

All of us must join in and DO IT NOW.

By this time we all know where we stand; if we have two good feet and a head of our own we can balance on top of them.

Let's agree right now to go into partnership with our own town and work like honest, loyal partners.

BE FOR BRIDGEPORT

As to the Bridgeport Housing Company, it was announced that the methods which it would employ in its operations were:

1. Scientific planning along advanced lines, which should determine the character and arrangement of roads and houses, and thereby secure the best and cheapest results.
2. Wholesale operations and efficient management, thereby effecting economies in construction.
3. The use of durable materials, thereby saving the serious depreciation in cheap frame dwellings.
4. Limiting the number of houses per acre, thereby avoiding the evils of overcrowding.
5. Providing for community buildings and playgrounds, thereby promoting the social life of the neighborhood.
6. Eliminating excessive profits, the earnings above 6 per cent to be used for the benefit and development of the property.
7. Distributing payments for a home over a period of years, thereby bringing it within the reach of all who desire to improve their home conditions.
8. Assisting the workingman to own his home by providing a financial scheme of small regular payments within the limits of his wages.

Bridgeport has had good reason to be proud of

her accomplishments. Faced with emergencies which taxed her resources beyond their limits, she set herself vigorously and persistently to her tasks. The newly self-conscious city saw that her future growth should be through ordered progress. She has formed the habit of securing expert advice. She has already begun to reach higher standards of public health, of schools, of recreation, and of housing.

Accomplishment of these civic tasks, excellent as they are, does not, however, cover all that Bridgeport must yet do for the good of the community. Daily living outside the factory may be made richer and happier and more healthful by these civic activities, but the improvement in industrial conditions has not been part of the program of the city. Women still work at night, a lamentable reversion, and protection against accident and industrial diseases in munition shops is still inadequate, as is the amount of compensation for disability due to injuries. Connecticut has many statutes regulating industry, but this study shows that they have been of little avail in controlling working conditions in the munition factories, and that both the provisions of the law and their enforcement should be strengthened.

Frequent reference has been made in these pages to the experience of England in discovering that satisfactory production depended upon reasonably short hours, one day of rest in seven, and good working conditions in the plant. In the following section the results of these investigations

by the British Ministry of Munitions are summarized. Their findings, taken in connection with the facts discovered in Bridgeport before the war began, show that it has now become a matter of urgent, national need to safeguard conditions of work not only in the munition industry, but in all occupations essential to the life of the nation.

RECORD CARD USED IN THE INVESTIGATION

SURNAME	FIRST NAME	ADDRESS	FACTORY
Jones	Susan	--Arctic St.	U.M.C.

COUNTRY OF BIRTH: England — COUNTRY OF FATHER'S BIRTH: England — CONJ. COND. S. M. W. D.

YEARS IN THIS CITY: 8½ years — PREVIOUS RESIDENCE: England — AGE AT BEGINNING WORK: 12

OCCUPATION: Annealing — HRS.: BEGIN WORK: 3 p.m. — END WORK: 11 p.m. — TIME ALLOWED FOR LUNCH: 15 min.

TIME WITH THIS COMPANY: 4 weeks — MEANS OF OBTAINING POSITION: Applied at shop — WEEKLY HOURS: 46½

TIME IN THIS INDUSTRY: 4 weeks — PREVIOUS OCCUPATION: Men's clothing -- tailoring

MEMBERS OF FAMILY AT HOME

RELATIONSHIP TO WORKER	AGE	PAID WORK OUTSIDE HOME	USUAL WEEKLY EARNINGS	WEEKLY AMT. PAID TO HOME	REGULARITY OF WORK	REASON FOR IDLENESS	OTHER OCCUPATION (SCHOOL, HOUSEWORK, ETC.)
Worker	33	Munitions	$9.00	$9.00	Reg.	---	Housework
Husband	35	Munitions	$13.00	$10.00	Reg.	---	---
Daughter	10	---	---	---	---	---	School
Daughter	8	---	---	---	---	---	School
Son	6	---	---	---	---	---	School
Son	4	---	---	---	---	---	---

HOME: TYPE: Three-decker flat — RENT: $20.00 — NO. ROOMS: 5 — TOTAL PERSONS IN HOUSEHOLD: 6

LODGERS: MEN: --- — WOMEN: --- — AMOUNT PAID WEEKLY: --- — OTHER SOURCES OF INCOME: ---

DATE: Aug. 18, 1916 — INVESTIGATOR: Hewes — SOURCE OF INFORMATION: Worker at home.

COMMITTEE ON WOMEN'S WORK. FORM 24. AUGUST '16

MUNITION WORKERS IN ENGLAND AND FRANCE

A SUMMARY OF REPORTS
ISSUED BY THE BRITISH
MINISTRY OF MUNITIONS

BY HENRIETTE R. WALTER

MUNITION WORKERS IN ENGLAND

OUT of the exigencies of the great war there have developed in England striking industrial problems. After nearly a year of wasteful production that exhausted men and machinery, government officials realized that instead of "sprinting as if for a short race, the course would be a long one"; and that the labor power of the nation should be as zealously safeguarded as its military strength. The futility of helter-skelter haste was dramatically brought home to all England by the famous shell shortage in the spring of 1915, for which Kitchener was blamed. It was a case of the situation's running away with those who should have controlled it. The sudden call for large amounts of clothing, munitions, food, and other necessities of war time, had taken the manufacturers completely by surprise, and the rush to fill orders demoralized industrial conditions. Overtime became the rule, night work and Sunday work were common. Trade unions saw the gains of years swept away. Nearly a year was gone before the government assumed responsibility for organizing the huge business of making war supplies, and almost another year was required to complete an organization which was efficient.

The crux of the situation was of course in the munition industry. August, 1914, found the nation without enough guns, shells and other war

equipment to carry on its great military operations and with no way to get them quickly or in large volume. In response to the unprecedented demand for these materials had come an immediate expansion of the industry, which soon exhausted the supply of skilled men and forced employers to recruit their workers from the ranks of the unskilled, both men and women. Stimulated by the exhortations of the press and of cabinet officers and by the public sentiment generally, the expansion proceeded, but without effective organization or control until the spring of 1915.

In the meantime the problem in England had changed during the last six months of 1914 from a serious unemployment situation in July and August to a definite shortage of labor in December. Early in 1915 a campaign was planned to recruit workers, and conferences were urged to settle the grievances of those already at work. In February a committee was appointed to deal with the disputes constantly arising. In March the Board of Trade planned a mobilization of women to do the work of men who had been called to the front, which brought immediate response. In that same month Lloyd George, then Chancellor of the Exchequer, effected a truce with the trade unions which should last through the war, and secured for the government, through the passage of the Defense of the Realm Act, the right to commandeer any factory and turn it over to the production of war munitions. Finally, in April, after eight and a half months of war, it was announced

that Lloyd George would head a board "to organize the national output of munitions of war," and about a month later, at the time of the formation of the Coalition Cabinet in May, 1915, a Ministry of Munitions was created, with Lloyd George as its chief.

This step gained, a program of action was decided upon. A munition bureau was organized; all factories making war material were placed under the control of the government; skilled workmen at the front were recalled to work in munition plants; men in the colonies and in the United States, experienced in the making of munitions, were offered free transportation to England; a suspension of union rules was brought about, and finally, in July, 1915, the passage of the Munitions of War Act effected. This bill prohibited strikes and lockouts in war industries, substituted compulsory arbitration, and suspended all trade union rules calculated to hamper production. On the other hand, as a concession to labor in recognition of the sacrifices it was making, the profits of employers were limited, and amounts in excess reverted to the national treasury. Provision was also made under the act for the recruiting by the trade unions of a voluntary army of workmen from among their members who would sign agreements to go to work wherever their labor was needed. The existing local munition committees were transformed into labor courts, with power to fine individual workmen for "slacking," for infraction of agreements signed by them as mem-

bers of the voluntary army of workmen, and for any offenses "tending to restrict production," and with the further power to make decisions in regard to changes in existing wage rates.

By this time workers on munitions saw themselves stripped of all rights and safeguards that had been theirs in time of peace. Confusion reigned in the industry. In the first burst of patriotic fervor, everything had been sacrificed to speed. Labor laws had broken down; excessive hours of work prevailed. Thousands of women, many of them totally unaccustomed to factory work, had taken up the tasks of the men who were fighting. Employers, taking advantage of the fine spirit in which the women offered their labor to the nation, were in many cases paying very low wages. Labor unions were dissatisfied with the setting aside of their rules, and especially with the so-called "dilution" of labor. The country fairly seethed with threatened and active labor disturbances.

The Munitions Act seemed to aggravate rather than to appease this dissatisfaction. The munition courts, especially, appeared to antagonize the trade unionist, because of biased administration of the provisions of the Act. On account of the power of employers to refuse discharge certificates to their employes, workers could be kept wageless and idle for weeks at a time, or be forced to accept wages far below the standard rates, or be compelled to work excessive overtime, at night or on Sunday, and without extra remuneration. These

and other arbitrary powers the munition manufacturers were permitted to exercise without restraint by tribunals made up, as *The New Statesman* put it, of "persons who seem to regard it as a patriotic duty to refuse to listen to the workman's 'excuses,' and to inflict summary and exemplary punishment in every case brought before them."* The London *Times* admitted that the Act had occasioned some serious friction in important munition areas because of certain details of administration. The composition of the tribunals, the lack of uniformity in wages of women and unskilled men in government factories and in "controlled" establishments, and the administration of the leaving certificate system were the "details" which had aroused the resentment of the workers. The government, however, and the middle and upper classes failed to understand the nature of Labor's grievance and considered it only a petty disloyalty which made workers rebel at personal injustice in a time of national crisis.

The Munitions Act thus failed to accomplish its main purpose, namely, the recruiting and holding of workers in sufficient numbers to insure an adequate supply of munitions. Moreover, dissatisfaction does not tend to increase output. The shortsightedness of a policy which permitted workers to be worn out by exhausting conditions, especially at a time when they could not be readily replaced, was brought home anew to government officials. They realized then, too, a thing which

* *The New Statesman,* November 6, 1915, p. 99.

was not evident at the beginning of the present conflict—that the war would not be over in a month or a year, and that the health of the workers must be conserved if production was to be maintained over a long period.

The realization of these facts on the part of those entrusted with the task of supplying arms and ammunition for the British forces led to the appointment, in September, 1915, of a committee under the Ministry of Munitions, called the Health of Munition Workers Committee, "to consider and advise on questions of industrial fatigue, hours of labor, and other matters affecting the physical health and physical efficiency of workers in munition factories and workshops." This Committee proceeded, under the chairmanship of Sir George Newman, Chief Medical Inspector for the Board of Education, and with a membership* well qualified for its duties, to inquire into the actual conditions then prevailing, with a view to making recommendations which would result not only in greater comfort for workers, but also in increased production by a more physically fit and better satisfied labor force. The findings of the Committee have been embodied in a series of

* Sir George Newman, M. D. (Chairman), Sir Thomas Barlow, Bart., K. C. V. O., F. R. S., G. Bellhouse, Factory Department, Home Office, Professor A. E. Boycott, M. D., F. R. S., J. R. Clynes, M. P., E. L. Collis, M. B., Factory Department, Home Office, W. M. Fletcher, M. D., F. R. S., Secretary of Medical Research Committee, Leonard E. Hill, M. B., F. R. S., Samuel Osborn, J. P., Miss R. E. Squire, Factory Department, Home Office, Mrs. H. J. Tennant, E. H. Pelham (Secretary).

memoranda and reports, submitted in November and December, 1915, in January, July, August, and October, 1916, and in February, 1917. The subjects treated may be grouped, for consideration here, under five main heads: (1) hours of labor; (2) health and hygiene; (3) general welfare provision; (4) employment of women; and (5) juvenile employment.

HOURS OF LABOR

Under pressure of the need to increase production beyond any conception of past experience, the first established principle of working conditions to give way was, naturally enough, the restriction of hours. This was the problem, also, which first attracted the attention of the Health of Munition Workers Committee.* The work of the Committee in this field covered the questions of Sunday labor, overtime, night work, rest periods, and holidays, as well as special study of the relation of output to hours of work. The standards set forth in their recommendations do not represent the ideals of the Committee, but are especially adapted to the exceptional emergency, and are based on the expectation that the war will be of long duration.

Sunday Labor: A memorandum on Sunday labor was presented soon after the appointment of the Committee, as an interim report, the matter

* Three memoranda are devoted to a discussion of this subject: No. 1, Sunday Labour, November, 1915; No. 5, Hours of Work, January, 1916; No. 12, Statistical Information Concerning Output in Relation to Hours of Work, July, 1916.

being deemed of such urgent importance that it was thought desirable not to delay its discussion until they were in a position "to deal with other questions falling within their terms of reference."

The Committee found, strangely enough, the great majority of employers opposed to Sunday work. They were beginning to realize that from the administrative end it imposed too severe a strain on the foremen, who were difficult to replace; and, from the economic standpoint it meant higher wages with but slight increase in output and irregular attendance on other days of the week. They felt, also, that in its religious and social aspects "the seventh day as a period of rest" was "good for mind and body." In spite of this attitude on the part of employers, however, Sunday labor had been widely adopted, partly on account of the heavy demands on output and the necessity of taking every means of increasing production, and partly on account of the desire of workers to make the double, or at least increased, pay which was given. In many cases the hours of labor on Sunday were considerably shorter than on other days, but there were still a number of factories where they were as long as on other days, if not longer, as in cases where the change from a twelve-hour day shift to a twelve-hour night shift was made by working for a continuous period of eighteen hours. Permits for Sunday work even for "protected persons" (i. e., women and young persons under eighteen years of age) had been issued for 50 plants to cover women,

boys and girls, and for 30 more to cover boys only. These permits had often been conditioned on the workers being employed for short hours on Sunday, or on having time off on Saturday. According to the Chief Factory Inspector's report for the early period of the war,* many employers assumed that the labor laws were not binding in the emergency, and disregarded their restrictions without applying for permits. For men, moreover, such permits were not required, and their employment on Sunday was consequently more widespread than that of "protected persons."

Statistics on the output from Sunday labor were not available at the time of the publication of the Committee's first report. One important firm, however, found that by instituting a working week of six rather than seven days, the average weekly hours, instead of being diminished, actually increased from 59¼ to 60, indicating an improvement in attendance on the six work days. Moreover, the hourly output had increased. Many other employers conceded that seven days' labor produced only six days' output, and that reductions in Sunday work had not resulted in any appreciable decrease in product. Even less observant managers had begun to detect the effect of strain on the workers. Employers were realizing the necessity of conserving the workers' strength in order to maintain the maximum output over a

* Great Britain. Home Office. Annual Report of the Chief Inspector of Factories and Workshops for the year 1914. London, 1915.

longer period than had been at first estimated. The workers, too, commenced to feel the need of more rest. The strain was beginning to tell, especially on those who in ordinary times would have absented themselves from work on account of ill health but who now stuck to their jobs. The higher rate of pay for Sunday work had at first made it popular, but the great majority of workers were now disposed to forego the extra money for the sake of the needed rest.

The conclusion reached by the Committee in regard to seven-day work may be summed up as follows:

"The evidence before the Committee has led them strongly to hold that if the maximum output is to be secured and maintained for any length of time, a weekly period of rest must be allowed. Except for quite short periods, continuous work . . . is a profound mistake and does not pay . . . output is not increased. On economic and social grounds alike this weekly period of rest is best provided on Sunday." After remarking that the need for this relief was greater for "protected" persons than for adult males, and for men on overtime than for those on double shift, the Committee nevertheless recommended "that the discontinuance of Sunday labor should be of universal application and should extend to all classes of workers." Pending a general discontinuance of Sunday work, if immediate change was found difficult, they suggested ways of improvement, such as reducing Sunday hours, giving all workers al-

ternate Sundays off, omitting one or two shifts on Sunday in cases of the triple-shift system, or at least discontinuing the eighteen-hour work period in changing from day to night shifts. It was further noted that "foremen and the higher management even more certainly [than the workers] require definite periods of rest," on account both of their heavy burden of responsibility and of the difficulty of replacing them. The Committee finally stated that in order to secure any large measure of reform, definite orders to restrict Sunday work might be necessary.

Overtime: Overtime, by which is meant a lengthening of the normal hours of work, was the most commonly used and most abused expedient for attempting to increase production, especially in case of skilled men who were difficult to recruit in large numbers. During the first year of the war even a week of ninety hours was not uncommon. A tendency to reduce hours of work was apparent, however, as early as January, 1916, when the recommendations of the committee were submitted. Still, excessive overtime had by no means disappeared, since seventy- and eighty-hour weeks were frequently encountered. While no serious breakdown among the workers was then apparent, the Committee remarked that "it is self-evident that men cannot work continually fifteen hours a day with good effect," and "general statements indicative of fatigue have been received," especially in regard to women and older men. Moreover, the question was not whether the

workers had been able to withstand the strain up to that time, but whether they could continue to do so over a long period. The Committee recognized that overtime could not be altogether abolished during the crisis, but felt it was possible to compromise on a course midway between the standards of peace and the extremes to which a shortsighted policy had driven employers and workers. In general they suggested that double or triple shifts be substituted wherever possible for overtime.

Intensive medical studies* of both men and women workers carried on by the Committee from December, 1915 to August, 1916 supported their first impressions of the situation. Men employed at heavy work were found to be working as much as 108 hours a week; boys under eighteen in some cases were averaging over 80 hours and in some weeks had worked 90 and even 100 hours; some of the women and girls examined had a regular seventy-seven-hour week. These workers, and even those whose hours were not quite so excessive, gave evidence, according to the investigators, of exhaustion and fatigue. "Pale, anæmic, dull and expressionless" are the adjectives used to describe many of the boys who were examined, for it was among these young workers that the most serious effects on health were found. On the other

* Health of Munition Workers Committee. Interim Report. Industrial Efficiency and Fatigue. Part II. Medical Studies. London, February, 1917.

hand, the workers on eight-hour shifts showed a marked superiority in health, in general appearance, and in efficiency. It was found that "the proportion of physically unfit increased with the length of hours of work." Though the investigators stated that the amount of fatigue was less than they had anticipated under the abnormal conditions, they still felt that the effects of excessive overtime were so serious that an actual shortage of labor would result unless hours should be limited in the immediate future.

For adult males the Committee recommended a maximum working week of sixty-five hours, including all overtime; a concentration of overtime on three or four days of the week which should preferably be not consecutive, and a discontinuance of working from Friday morning all through Friday night and until Saturday noon. For women and girls they recommended that continuous work in excess of sixty hours a week be discontinued as soon as practicable, since the strain of excessive hours is without doubt even more serious for them than for men. The need for overtime among women, moreover, is not so pressing, because of a large reserve of female labor. In regard to boys who are used so widely to assist men, the Committee recommended, "though with great hesitation," that they be permitted the same maximum hours as men, but that substantial relief be provided at week-ends and that those under sixteen should not be made to work more than sixty hours.

Increased Production with Shorter Hours: A special study,* published nearly eight months after the first recommendations on hours, supplemented the more general observations, and provided a statistical basis for the conclusions of the Committee regarding the relation of working hours to volume of production. In several large munition plants the output of different groups of workers had been followed over periods of from eighteen to twenty-seven weeks. In the case of 100 women engaged in turning fuse bodies, which is moderately heavy work, a reduction in the average hours worked per week from 68.2 to 59.7 was followed by a 23 per cent increase in hourly output and a net rise in weekly output of 8 per cent. This change effected also a decrease of two hours in the amount of "broken" time per week. While this reduction of working hours to sixty a week proved so successful in increasing output, a further decrease showed that an equally large output could be maintained in fifty-six hours or even less. That this remarkable rise in production rate was effected without any change in machinery, tools, raw materials or nature of the operation strengthens the validity of the findings. A possible increase in skill among the operatives during the period studied was another element carefully tested and eliminated by the investigators.

Maximum Hours for War Time: Similar studies

* This study was undertaken for the Committee by Dr. H. M. Vernon. The results were published in July, 1916, as Memorandum No. 12, Statistical Information Concerning Output in Relation to Hours of Work.

were made of other groups of both men and women employed at different kinds of labor. It was found that the output of those engaged in the heaviest type of work was the most favorably affected by a reduction in hours. Especially was this true of the younger workers who were more sensitive to fatigue than adults. A group of boys ranging in age from fourteen to seventeen years, who were sizing base plugs, increased their hourly rate by 42 per cent and their weekly output 19 per cent when their hours were reduced from 68.3 to 57. Satisfactory results also were secured in the case of adult men. A group of 27 men sizing fuses, a particularly fatiguing process, increased their hourly rate 22 per cent, and their total weekly output 10 per cent when the average hours worked were decreased from 61.5 to 55.4. The general conclusions drawn were that in time of stress, for men engaged in very heavy work the maximum hours from the point of view of high production should be no more than fifty-six hours a week; for men on moderately heavy work, sixty; for men and boys on light work, seventy; for women on moderately heavy work, fifty-six, and for women on light work about sixty hours. It is pointed out, however, that these were maximum hours, that they imposed a great strain on operatives—in many instances one too great to be borne—and that, in fact, they applied only to the "fittest who were strong enough to survive in the struggle, not to the general mass of workers of all classes who tried their hand at munition work."

The "best hours for peace times" were considerably shorter in each case, the report stated, but whether it be a case of peace or war, the principle of varying the hours according to the character of the work, and the sex and age of the workers should be observed. The investigators also advocated speeding up the rate of production in order to reduce the number of hours actually spent in the factories and the institution of regular rest pauses to break the long five-hour spells.

Shifts and Night Work: In order to run the munition plants to maximum capacity, multiple-shift systems had been widely adopted. Two kinds of these were found: the double shift of twelve hours each and the three eight-hour shifts. Men workers were almost universally on the double shift, and the Committee saw no reason for change, since there was apparently no very ill effect and the supply of men was too scant to make the three-shift plan feasible. Women were employed sometimes on the twelve-hour shift, sometimes on the eight-hour shift. The recommendation was made that the twelve-hour shift for women be abandoned wherever the difficulties of housing and transit for additional workers could be overcome, that no girls under eighteen should work at night, and that in no case should night hours run over sixty a week. In the case of boys again it did not seem practicable to regulate their hours further, but it was urged that night work be restricted to those over sixteen, and that its effect on individual boys be carefully

watched. The Committee, to clear up any misapprehensions as to their attitude on night work go on record as not considering it a good thing in itself, but only as being preferable to excessive overtime. The objections which they set forth are: (1) it is uneconomical, because of the higher wages and lower output; (2) supervision is often unsatisfactory; (3) adequate lighting is difficult; (4) workers cannot secure the necessary amount of sleep during the day; and (5) digestion is deranged by the unwonted meal hours.

There was considerable doubt in the minds of the Committee's members at the beginning of their work as to the relative merits of continuous and discontinuous night work. Subsequently, as the result of careful studies* of output and health under the two systems, which were undertaken for the Committee during 1916 by Dr. H. M. Vernon, Prof. Thomas Loveday, Mr. P. Sargant Florence and others, it was definitely established that weekly alternation of day and night shifts is productive of better output and better timekeeping than continuous night work. The Committee, therefore, urge that both for men and for women continuous night shifts be abandoned. Incidental to these studies, evidence was encountered of larger output and greater efficiency among continuous day workers than among continuous night workers. For example, in the case department of

* Health of Munition Workers Committee. Interim Report. Industrial Efficiency and Fatigue. Part I, pp. 26-40. London, February, 1917.

a cartridge factory 25 night workers during an eleven-week period showed an inferiority in rate of output to 84 day workers, which ranged from 13 to 21 per cent.

Rest Periods and Holidays: The common practice in regard to rest and meal periods on the twelve-hour shift was to allow half an hour for breakfast and an hour for dinner if the shift began at 6 a. m., or only an hour for dinner if it began at 7 or 8, the worker being supposed in this instance to have breakfasted before coming to work. In the latter case the Committee recommended a break in the morning for tea, especially as many workers must travel such long distances to reach their places of employment that breakfast is taken very early and the wait until dinner is too exhausting. On night shifts in many instances only two half-hour periods were allowed. The Committee recommended one hour and one half-hour break, or two periods of three-quarters of an hour, especially for women. On the eight-hour shift it was customary to allow half an hour for meal time, and this, they thought, was adequate. In their opinion, also, the ordinary factory holidays should not be interfered with, as these allowed needed recuperation from fatigue.

HEALTH AND HYGIENE

The study of hours of labor led the Newman Committee, as the Health of Munition Workers Committee is often called, inevitably to the consideration of particular problems of health, such

as fatigue and industrial disease, as well as the allied topics of work accidents, factory sanitation, and the like.*

Industrial Fatigue: The Committee, in their study of industrial fatigue, went carefully into its causation and its signs and symptoms, the rhythms of action and rest and their relation to the worker's efficiency. Running through the entire consideration of this subject is a recognition of the relation between scientific management and industrial fatigue. The achievements of Germany and America in this direction are pointed to, and the Committee, looking into the future, ventured to hope "that the study of industrial fatigue and the science of management based upon it, which is now being forced into notice by immediate need, may leave lasting results to benefit the industries of the country during the succeeding years of peace."† Fatigue is defined as "the sum of the results of activity which show themselves in a diminished capacity for doing work," not to be determined in its early stages, at least, by the subjective sensations of the worker, but by such objective signs as decreased output, spoiled work, accidents, sick-

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*Memoranda on these subjects are: No. 7, Industrial Fatigue and Its Causes, January, 1916; No. 8, Special Industrial Diseases, February, 1916; No. 9, Ventilation and Lighting of Munition Factories and Workshops, January, 1916; No. 10, Sickness and Injury, January, 1916; No. 14, Washing Facilities and Baths, August, 1916; and No. 15, The Effect of Industrial Conditions Upon Eyesight, October, 1916.

† It should be noted that scientific management as alluded to in this report is concerned primarily with motion study. No mention is made of time study combined with motion study.

ness, lost time, or "staleness." Of these tests the most direct is diminished production, and measurements of the output of the shop and the individual worker are suggested as indices. "Slacking," which has been charged against the British workers during the war, the Committee believed to have been discontinued to a great extent through patriotic incentive. Moreover, they held that some deliberate "slacking" might actually give an improved output by sparing wasteful fatigue, and go even farther in saying that "it cannot in such circumstances be said that a workman so restraining himself, consciously or unconsciously, is doing more to damage the output on the whole than the employer who has arranged overlong hours on the baseless assumption that long hours mean high output." Evidence is presented from statements of employers indicating that there was slacking, "often quite unconscious," in the twelve-hour shift, which was not found under the three-shift system, and that without this restraint the output for the twelve hours would be even lower. On the whole, the Committee were of the opinion that, although in isolated instances intelligent precautions against fatigue had been taken, munition workers in general had been allowed to reach a state of reduced efficiency and lowered health which might have been avoided had proper attention been given to daily and weekly rests.

An exceedingly valuable scientific study of industrial fatigue which should be mentioned in con-

nection with the work of the Health of Munition Workers Committee was made, not by this Committee, but for the British Home Office, by Prof. A. F. Stanley Kent, and published in two reports.*

The first of these reports describes the methods used in working out physiological tests for the presence of fatigue, its degree and the worker's power of recovery. The second presents a comprehensive application of these tests to workers in seven different factories, over periods ranging as long as three and a half months, together with the findings based on the results of these experiments. The most extensive studies made were in a surgical dressings factory and an engineering plant, both subject to extreme war pressure. Dr. Kent's findings all support the recommendations of the Health of Munition Workers Committee regarding the abolition of Sunday labor, reduction of overtime, rest intervals, and the like. The most important evidence for a country at war was that showing the effect of fatigue and overtime on production. It is shown that total daily output may be actually diminished by the introduction of overtime because increased fatigue affects the production not alone of the actual overtime period, but of the regular working hours as well. One group of workers made an absolute increase in output of over 5 per cent, as a result of shortening their working day from twelve to ten hours. Un-

* Interim Report on an Investigation of Industrial Fatigue by Physiological Methods (Cd. 8056), August, 1915, and Second Interim Report on an Investigation of Industrial Fatigue by Physiological Methods (Cd. 8335), August, 1916.

satisfactory output during the early morning period (6 to 8 a. m.) was attributed largely to lack of rest, food, and to general discomfort in home conditions, due, though indirectly, to excessive hours of labor. Professor Loveday, who made a special investigation* of the causes of broken time for the Newman Committee, recommends in his conclusions that all work before breakfast—a custom which prevails in many English factories—should be abolished since it gives inferior output, lowers health, and leads to poor attendance at work.

Sickness Among Workers: The two factors of sickness and injury often indicate the presence of industrial fatigue. In relation to both of these problems the Newman Committee formulated programs for prevention and treatment.† After pointing to the relation between bad industrial conditions and ill health, the Committee urged that employers give special attention to guarding against cramped posture at work, prolonged or excessive muscular strain, poor ventilation, heating and lighting, exposure to poisons, gases and dusts, and, of course, against excessively long hours, especially at night. Personal hygiene on the part of the employe was also emphasized as of importance, both to him and to his fellow workers. A system of record-keeping was recommended for

* Health of Munition Workers Committee. Interim Report. Industrial Efficiency and Fatigue. Part I, pp. 41-67. London, February, 1917.

† Ibid, Memorandum No. 10, Sickness and Injury, London, January. 1916.

absences, sicknesses, and deaths, as a valuable index of the health of the workers. One of the latest memoranda* issued presents a model medical certificate to be used by physicians in accounting for the absence of workers from their regular jobs. In one munition plant with a force of 36,000, where careful records were kept, it was found, in a study of two departments, that the sickness rate among men working overtime was 5.5 per cent as against 3.7 per cent among those on double shift. In one of these departments, among 1,000 men on overtime the rate was as high as 8 per cent. The monthly sickness rate for the entire plant rose from 2.9 per cent in July, 1914, to over 4 per cent in the first quarter of 1915, and in another large plant the rate had risen to 7 per cent. These increases were attributed to overtime, night work, and the large number of new employes. Moreover, Professor Loveday concludes as a result of his studies noted above that the amount of lost time due to sickness is greatly underestimated in factory records, and the proportion due to slackness consequently overestimated. In instances where an increase in sickness has not been noted since the war, the fact is accounted for by high wages and good canteen provision. The harmful effect on health of long hours and especially of Sunday labor is brought out by figures quoted also by Professor Loveday. In one factory during the spring when there was much Sunday work, "no

* Ibid, Memorandum No. 16, Medical Certificates for Munition Workers. London, February, 1917.

fewer than 22 per cent of the men were at one time sick; but the number of men on the sick-list in August when Sunday work had been much reduced . . . was only a trifle over 4 per cent of the whole body."

As part of a program of prevention, a preliminary medical examination was recommended for all workers, and in special departments and danger zones a periodic examination as well. In some plants this was the practice, and had been found to be of great advantage. Such a system of examinations and a program by which unfavorable working conditions should be reduced to a minimum represent the preventive side of the Committee's recommendations. For cases of actual sickness they advised medical and nursing resources for each plant.

Accidents: On the side of accident prevention the Committee recommended, of course, the guarding of machinery, the adoption of safety appliances, the regulation of dangerous processes, adequate lighting of the shops, and careful cleaning of machinery. To further the co-operation of employes in avoiding accidents they advocated the forming of committees of workers to investigate all accidents occurring in the departments in which they are at work. Employes should also be instructed in regard to accidents by the vigilant supervision of the foreman and through the distribution of leaflets and the posting of placards. A certain number in each department should receive training in first aid.

Since injuries in munition factories occur almost inevitably because of the dangerous nature of the work, provision should be made for their prompt and effective treatment. More careful attention should be given to minor injuries which now often go untreated and frequently develop serious complications. For these, local dressing stations were suggested, and for the more serious accidents a central room with more elaborate equipment. Full records should be kept of accidents and of their treatment.

The urgent necessity for such provisions in munition plants was emphasized by figures supplied by certain representative shops, showing the frequency of accidents under the present abnormal conditions. In 11 plants employing a total of about 38,000 workers, 35,000 surgical dressings had been performed during the first ten months of 1915. In still another munition factory, during the fall of 1914, when working hours were from 8 a. m. to 5:45 p. m., an average of 100 first-aid dressings were performed each month per 1,000 employed, while in 1915, for the same period, on the day shift from 8 a. m. to 8 p. m., the average rose to 292 per 1,000 and on the night shift from 8 p. m. to 8 a. m., to 508.

Industrial Diseases: Industrial diseases constitute a special phase of the health problem in the manufacture of munitions and have been a cause of serious concern to the Health of Munition Workers Committee.* The most important poi-

*Health of Munition Workers Committee, Memorandum No. 8, Special Industrial Diseases. London, February, 1916.

sons to which workers in this industry are exposed are lead, tetrachloride of ethane, nitrous fumes, tetryl, fulminate of mercury, and tri-nitro-toluol. Lead is used in making bullets, and in various subsidiary processes; tetrachloride of ethane, an ingredient in the varnish applied to the wings and bodies of aeroplanes, has been discovered only since the beginning of the war as an industrial poison; nitrous fumes are produced in the manufacture of almost all explosives; tetryl, fulminate of mercury, and the highly explosive T.N.T. (trinitro-toluol), of whose double dangers munition workers have learned so much, are all three used in making powders, but they may cause poisoning even in handling the powder in loading shells or primers. The first three of these poisons are the more dangerous because they cause serious or even fatal illness. The last three cause skin affections, active dermatitis or eczema, and often more serious disorders. In fact, instances of death resulting from T.N.T. poisoning have been noted in the English newspapers. In the case of fulminate of mercury, regarding which complaints have been made by workers in such an important American munition center as Bridgeport, Conn., eczema is the usual affection, but mercurial poisoning, which is even more serious, may occur. Certain fluids used in lubricating and cooling metal may also cause eczema.

For each of the poisons mentioned a description of the resulting disease has been given by the Committee as well as measures for prevention and

treatment. Provision of proper washing facilities and of protective overalls, periodic medical examination, transference to other work of those readily affected and the reduction of the period of exposure through the absence of overtime are recommended as general steps to avoid industrial poisoning. Exhaust ventilation was advocated for drawing off fumes and dust; the wearing of respirators as a protection against dust that cannot be carried off by exhausts or allayed by wetting; emergency helmets provided with a supply of fresh air from without for those exposed to escaping fumes; head coverings for women and gauze veils to protect the faces of workers against poisonous dust. As further general preventive measures, it was urged that only healthy and temperate persons be employed, and that none exposed to poisons be permitted to begin work without having taken food.

Washing Facilities: The importance of washing accommodations has been strongly emphasized by the Committee not only for workers engaged in processes involving poisons or excessive heat, dust or dirt, but for the good health, efficiency and self-respect of the entire force. One of their memoranda* offers practical suggestions as to the most suitable arrangements, both for washing facilities and for baths.

Ventilation, Heating and Lighting: At a time when so large a number of new plants were being

* Health of Munition Workers Committee. Washing Facilities and Baths. Memorandum No. 14. London, August, 1916.

erected and old ones enlarged, it was also fitting that the importance of ventilation, heating and lighting should be emphasized. This has been done by the Health of Munition Workers Committee in pointing out the close connection between proper provision for these three elements in factory construction and the maintenance of maximum output by the worker. Suggestions regarding modern standards and methods were made by them in considerable detail.*

Eye-Strain: Closely connected with the problem of lighting factories was the prevalence of eye-strain and the danger of eye accidents among munition workers.† Eyesight may be impaired through exposure to intense heat, to industrial poisons, or through "uncorrected errors of refraction." Special inquiry has revealed a large increase not only of eye-strain, but also of eye injuries, among munition workers since the beginning of the war, many of which were preventable. For example, the wearing of proper guards or goggles protects the eyes from flying particles and colored glass lessens irritation where there is exposure to brilliant light, as in acetylene welding.

The eyesight of operatives who are to be engaged on fine work should be carefully tested. In case of slight accident, first-aid treatment should be provided to prevent serious after-effects. Since

* Health of Munition Workers Committee. Ventilation and Lighting of Munition Factories and Workshops. Memorandum No. 9. London, January, 1916.

† Ibid. The Effect of Industrial Conditions Upon Eyesight. Memorandum No. 15. London, October, 1916.

eye-strain is often concomitant with general fatigue, it is bound to accompany overlong hours, night work and undernourishment. Hence we have again a plea—and a reason—for the improvement of working conditions in general.

Work Incentives as Health Factors*: Of all the varied influences affecting the health and efficiency of munition workers the most complex and intricate are incentives to work. The Committee's investigators found that the better the organization and the better the hygienic environment, both in the factory and in the home, the greater is the stimulus to activity on the part of the worker. The main incentive, however, which leads to greater output is wages. A piece rate system which the worker can easily understand, according to their findings, may be expected to give a larger output than time wages, and the rise and fall of earnings of individual workers under such a system is another valuable indication of their health and efficiency. It is important, also, in order to have the desired result in output from a piece-wage system that workers be prevented from exhausting themselves through overspeeding, that well-planned rest pauses be provided, that workers be instructed in the most efficient methods of performing processes of work, and that hours be not too long to permit of opportunity to enjoy what the wages can buy.

* Ibid. Interim Report. Industrial Efficiency and Fatigue. Part I, pp. 69-84. London, February, 1917.

GENERAL WELFARE PROVISION*

In addition to the factory environment and the length of the work period, other factors which do not come ordinarily within the jurisdiction of the management distinctly affect the efficiency of workers. Housing, transportation, canteens, and the welfare of individual workers are the most important among them. The Newman Committee very strongly recommend that through the appointment of welfare supervisors employers should endeavor to control any detrimental effect on the workers of poor housing, undernourishment, and unfavorable living conditions.

Housing of Workers: The sudden influx into districts surrounding munition plants has greatly overtaxed the housing accommodations. In many instances, dwellings intended for one family are occupied by several, and beds are used in day and night shifts. Before any comprehensive plan for the increase of housing accommodations is undertaken, inquiry is recommended into the extent of the need, but pending action, the welfare supervisor can help matters by keeping a register of available houses and lodgings, by aiding workers in need of rooms, and by notifying the management when the supply is insufficient.

Transit: Because of the housing shortage, many workers are forced to live at considerable distance from their places of employment. Traveling to and fro in overcrowded cars and trains,

* Health of Munition Workers Committee. Welfare Supervision. Memorandum No. 2. London, December, 1915.

losing time by waiting, making long and tiresome journeys, which further extend an overlong day or night of work, decrease both efficiency and resistance to disease. Workers were found who left their homes daily before 5 a. m. and returned at 10 p. m. or later, leaving little more than six hours for sleep—and family life. The Committee suggested that the welfare supervisor ascertain the means of transit used and the length of time spent in traveling, indicate the need for increased transportation to the right authorities, and suggest modification of factory hours to suit existing transit conditions.

Industrial Canteens: "The munition worker, like the soldier, requires good rations to enable him to do good work." This fact the Committee recognized in their recommendations regarding canteens in the large war supply factories.* In one of their earliest reports, they pointed out the difficulty encountered by employes in securing good food, when the employer has made no provision, and urged the establishment of industrial canteens in all plants, but especially when workers are employed in large numbers at night and are unable to go home for a hot meal. They made suggestions regarding dietary, cost of food, the best type of canteen to adopt, as well as its management. It was conceded that it might be desir-

* Industrial Canteens, No. 3, November, 1915; Canteen Construction and Equipment, No. 6, January, 1916; and Investigation of Workers' Food and Suggestions as to Dietary, No. 11, July, 1916, London.

able in certain districts and under restrictions to sell alcoholic liquors.

Attention was also given to the actual physical construction, location and equipment of industrial canteens. A study of typical meals furnished to munition workers in industrial canteens, served in restaurants, or brought by them from home was undertaken for the Newman Committee by one of their members, Mr. Leonard E. Hill, in the laboratories of the Medical Research Committee. In his report Mr. Hill stressed the relation of both physical and nervous fatigue to the workers' daily diet, and with his analysis of the meals examined as a basis, made suggestions for a "well-balanced minimum" dietary for canteens.

Individual Welfare: Aside from the help the supervisor can render in solving problems of housing, transit, and food, even greater service can be given in adjusting matters concerning the individual welfare of the worker which will be reflected in the efficiency of the labor force. Such functions include attention to cases of sickness or irregular attendance at work in co-operation with the medical staff, observation of individual reactions to night or Sunday work or overtime, planning for recreation and education, and the maintenance of proper discipline and conduct. The welfare worker should also be in close touch with the engagement of new labor or even attend to the actual engaging of workers. He—or she—should also investigate complaints and causes of dismissal. The Committee were emphatic in their indorse-

ment of welfare work for both men and women, but recommended especially the appointment of women supervisors where women and girls are employed.

EMPLOYMENT OF WOMEN

Although the problems discussed in all the memoranda of the Health of Munition Workers Committee affect women as well as men, the employment of women since the outbreak of the war has grown to such dimensions that a special report has been devoted to recommendations in this field.* The response of English women of all classes to their country's call has been one of the finest things of the war. Women of wage-earning experience and those of none—university and art students, teachers, secretaries, domestic servants, clerks, laundresses, textile workers — old women and young, married women and single, in a splendid spirit of patriotism, have volunteered in the army of labor, and because of their enthusiasm have achieved remarkable success. In September, 1916, the War Office published a report on Women's War Work "for the use of recruiting officers, military representatives and tribunals." It lists some 29 double-columned pages of processes in which women have been successfully employed in "temporary" replacement of men, and in a large number of photographs shows them engaged in such heavy jobs as coal-heaving,

* Health of Munition Workers Committee. Memorandum No. 4, Employment of Women. London, January, 1916.

stoking, boiler-making, cleaning locomotives and other work which they have never before been called on to do. Not alone have women taken up men's tasks willingly, but they have accepted without complaint conditions which were immediately detrimental to efficiency and which would, if continued, be disastrous to health, and this at a time above all times when the health of the present and future mothers of the nation should be safeguarded.

Night work for women, especially in the munition industry, has been revived after almost a century of disuse, and employment of married women and of young girls has, of course, increased. Hence it is of great importance to safeguard their period of employment. The Committee realized that in the emergency night work was inevitable, but urged that its evils be mitigated by careful supervision, by the provision of sufficient pauses for rest and meals, and, where desirable, by periodic change to the day shift. During the meal hour on the twelve-hour night shift women were found asleep beside their work, too exhausted even to go to an attractive mess room to get the food to sustain them during the remaining hours of the night. The recommendations for hours, shifts, overtime and rest pauses, for women workers are substantially the same as those already given in the section on hours of work.* Employment of mothers with infants was deprecated by the Committee, and the need of consideration

* See pages 109-114.

in arranging hours of work for married women was urged.

The questions of housing and transit were also given further attention in relation to women's employment. Many women were forced to spend two and three hours traveling each way to and from work. This often meant "a day begun at 4 or even 3:30 a. m., for work at 6 a. m., followed by fourteen hours in the factory, and another two or two and one-half hours on the journey back," ending finally "at 10 or 10:30 p. m., in a home or lodging where the prevailing degree of overcrowding precludes all possibility of comfortable rest. Beds are never empty and rooms never aired, for in a badly crowded district the beds, like the occupants, are organized in day and night shifts." Moreover cars were so crowded that the women's clothes were often torn in the struggle to get even standing room. There was, therefore, crying need for increased transportation which would also relieve the housing situation. But even with improved transit long journeys cruelly extended the day. Hence it was all the more necessary to guard against excessive working hours.

Good sanitary conditions in the factories are especially important for women wage-earners. Workrooms should be clean, bright and airy, well warmed in winter and well lighted at night. Cloakrooms, washing facilities and sanitary conveniences should be provided. For the protection especially of those unaccustomed to factory work, the lifting or carrying of heavy weights and the

strain of prolonged standing should be avoided. It is recommended also that a woman physician examine all applicants for employment. Careful oversight by forewomen, nurses, and women welfare supervisors in the fields of work, health and general well-being was a point much emphasized. In conclusion the Committee stated that in their opinion if the present conditions surrounding the employment of women continued, "it would be impracticable to secure or maintain for an extended period the high maximum output of which women are undoubtedly capable."

JUVENILE EMPLOYMENT

Special attention has been given also to the problems of child labor in war time.* The Committee declare that: "At the present time, when the war is destroying so much of its best manhood, the nation is under special obligation to secure that the rising generation grows up strong and hardy both in body and character. It is necessary to guard not only against immediate breakdown, but also against the imposition of strains which may stunt future growth and development." Such strains were found in the long hours of work, by day and by night, sometimes through seven days in the week, in the poor housing and transit facilities, and in the often unsatisfactory home conditions. Factory inspectors bore witness to the more

*Health of Munition Workers Committee, Memorandum No. 13, Juvenile Employment. London, August, 1916.
Ministry of Munitions. The Boy in Industry. London, 1917.

marked fatigue produced by overtime and night work on the adolescent than on the adult worker, a menace not only to present health but to growth and physical development. Moreover these children had no leisure, no recreation, no opportunity for continuing their education. Exemptions from the legal age limit had been permitted.* In a case cited boys of thirteen were allowed to work full time in a large munition center, provided they attended evening school. The Committee pointed out that it was worse than useless to require such attendance for boys who worked from 6 a. m. until 5 p. m. or longer.

The problem of boy labor seemed more pressing to the Committee than the employment of young girls, since boys, who to a great extent were employed to assist men, worked the same hours as men. Moreover boys under sixteen are said to be even more delicate than girls of the same age.

The recommendations regarding hours are similar to those already given. Boys should be permitted, if the work requires it, and conditions of employment are favorable, to work more than twelve hours a day up to a weekly total of 65, but

* The latest published figures (October 16, 1916) give a total of 14,915 children formally exempted on that date for agricultural work, but give no estimate of the number released for munition or other industrial employment. (Great Britain. Board of Education. School Attendance and Employment in Agriculture. Cd. 8171. December, 1916.) Mrs. Sidney Webb estimates that in addition between 50,000 and 60,000 children have left school for work without formal exemption, while Sir James Yoxall believes that between 150,000 and 200,000 children between eleven and thirteen have left school to go to work.

the overtime should be concentrated on three non-consecutive evenings of the week. One day's rest in seven should be assured. Night work should be permitted for boys under sixteen and girls under eighteen only when no other labor can be obtained. Because of the greater adaptability of youth, it was thought, when found absolutely necessary to employ them at night, that they would suffer less from weekly alternation of day and night shifts than adult workers. Furthermore, as young persons cannot profitably work for a continuous spell of five hours (the maximum legal period), short rests should be allowed, and time for refreshment when breakfast has necessarily been taken early. Not only should the ordinary holidays be granted, but, when possible, vacations of a week or more.

The situation is further complicated for young workers by overcrowding and bad home conditions. One large munition center revealed numerous cases in which three people slept together in one bed. A case said to be typical was described, in which a boy of fourteen slept in a bed with two young men, while in the same room two young girls slept in another bed. Because of the absence of fathers at the front parental control was often weakened. After a long day of work many children were tempted to stay out late at the movies or to dance, and their high earnings induced thriftlessness. Moreover an increase in juvenile crime had become so marked, according to comments in the press, that the Home Secretary had called a

special conference of social workers to deal with it. The Newman Committee recommended special welfare workers for boys and outlined in detail the duties of the "Boy Visitor." The Ministry of Munitions has further emphasized the importance of welfare work for boys and elaborated on the functions of the supervisors in a special pamphlet on "The Boy in Industry." The "Boy Visitor" should watch carefully the physical condition of the boys, visit them when sick, investigate other causes of irregular attendance, receive and dispose of complaints made either by employers or boys, advise before any case of dismissal, look into conditions of housing, transit and dietary, plan recreation, and promote plans for saving.

SUMMARY OF RECOMMENDATIONS

The reports of the Health of Munition Workers Committee give evidence of an enlightened and common-sense attitude toward the industrial problems which the war has created. A headlong, unthinking policy of blind haste had at first led to the needless waste of precious human strength. This panic has now given place to a realization of the fact that increased output is to be gained through the saving of the workers' health and strength, and an increase in the labor force, not through the taxing of endurance to the breaking point. But there is still need to hold up standards. These standards, as outlined by the Committee, may be summarized as follows:

I. HOURS OF WORK:

a. **Seven-day labor** should be abolished for men, women and children.

b. Excessive **overtime** should be done away with by the introduction of shifts.

c. **Hours of labor** should be adapted to the age and sex of the worker and the nature of the process to be performed.

d. **Night work**, where possible, should be organized in eight-hour, rather than twelve-hour, shifts, and in no case should women work at night more than 60 hours a week. Its evils should be further mitigated by sufficient rest periods and by periodic change to the day shift.

e. **Meal periods** should be at least an hour in length on twelve-hour shifts, and half an hour on eight-hour shifts. Further breaks should be allowed in long five-hour spells.

II. HEALTH AND HYGIENE:

a. **Industrial fatigue** should be decreased by a careful study of processes of work and of the most economical method of performing them.

b. Provision for both prevention and treatment of **work accidents, industrial disease**, and other **illness**, should be made in all munition plants.

c. Matters of factory **sanitation** such as ventilation, heating, lighting, and wash-

ing facilities should receive special attention.

III. GENERAL WELFARE:

a. Improvement of housing and transit facilities should enlist the co-operation of employers.
b. In the interests of health and efficiency, all munition works should have canteens where employes can secure hot food.
c. The appointment of welfare supervisors is recommended in all factories.
d. Problems involved in the increased employment of women and children should receive the careful attention of both managers and the government. Special welfare workers should be assigned to their oversight.

SUBSEQUENT CONDITIONS

The Committee on the Health of Munition Workers have not been fortunate enough to see all their recommendations adopted. The newspapers did not give publicity to their findings until some time after the reports were actually submitted, and they were then subordinated to matters of greater popular interest. Furthermore, while the government could make changes in the factories it owned, control over private establishments, which are in the majority, was not so complete.

Definite progress has been made, however, in

relieving the conditions which were the special point of attack in the memoranda of the Committee. Sunday labor has been decreased as a result of a circular issued by the Minister of Munitions in January, 1916, recommending that Sunday labor in "controlled" establishments be abolished. As a result it was reported in Parliament on March 30, 1916, that in 2,400 works inspected, 60 per cent had no Sunday work, and of the other 40 per cent, many were engaged only in repair work and others were manned by voluntary week-end workers. The attempt to relieve the strain on regular employes of Sunday work has led to the recruiting of a special force of week-end workers, made up largely of women of the leisure class, who volunteer their services for Sunday in order that the factories may be kept running and the regular workers released for rest. Dukes' daughters and generals' ladies, artists and authors, students and teachers, ministers' and lawyers' wives, make up the membership of the picturesque W. R. M. W. (Week-end Relief Munition Workers). They are paid at the current rates, and are "voluntary" only in the sense that they offer to work of their own free will. An order issued in April, 1917, has now made the abolition of Sunday work in both government and controlled plants of almost universal application.

No definite ruling regarding daily hours of work seems thus far to have been issued by the Ministry of Munitions, but in association with the Home Office it has formed a committee to regulate hours

as well as to secure a weekly day of rest for the workers. The effect of the steps taken and the vigor of their prosecution have been difficult to ascertain, but the tendency has been to reduce the amount of overtime. In August, 1916, in response to a question put in Parliament, Dr. Addison of the Munitions Ministry, who has since become Minister of Munitions in the Lloyd George cabinet, stated that the special joint committee on hours was taking steps to bring the hours for women and girls in controlled establishments within the sixty-hour limit allowed under the ordinary provisions of the Factory Acts. In April, 1917, a former investigator for the Newman Committee reported that in government-owned munition plants women were working on eight-hour shifts. This was not because of any general order but the result of action taken by the various local munition committees in whose hands the power of adjusting hours has been entrusted. The latest report of the Chief Inspector of Factories and Workshops remarks on the distinct tendency toward a reduction in amount of latitude sought by employers applying for overtime permits and a general voluntary decrease in working hours.

The recommendation of the Newman Committee that the ordinary holidays should not be interfered with was given a trial at Easter in 1916, but Lloyd George, then Minister of Munitions, claimed that in the fortnight which included Easter Monday the output had been decreased one-half. As a consequence, and also because of

the extra need of munitions for the great offensive on the Somme, the customary "bank" holidays at Whitsuntide and in August were not granted. Later, at the following Christmas and New Year's (1917), two extra days of holiday were given to make up for this omission, and in the spring of 1917 the usual Easter holiday was maintained.

Definite efforts have been made on the part of the government to carry into effect the recommendations of the Committee in regard to industrial canteens. A Canteen Committee was appointed by the Central Control Board (for liquor traffic), in conjunction with the Munitions Ministry, to assist firms in the construction and financing of canteens. In June, 1916, it was reported that canteens had been established in practically all the government-owned factories, and that in the "controlled" works the government had encouraged their introduction by subsidizing them, either through permitting employers to pay the expenses out of profits that would otherwise have reverted to the national treasury, or by contributing half the costs incurred by voluntary agencies such as the Young Women's Christian Association, in establishing an industrial canteen. The Canteen Committee also published in October, 1916, a pamphlet on Feeding the Munition Worker, as a "comprehensive and practical guide" to canteen construction and management.

Another important step affecting the general well-being of the workers was the establishment in the first quarter of 1916 of a special Welfare

Department under the Ministry of Munitions, to stimulate the development of welfare supervision in the war factories. This department, under the superintendence of Mr. B. S. Rowntree, also undertakes inquiries into working conditions, including hours of work and wages, endeavors to correct evils where they are found, encourages the provision of rest rooms and canteens, and through a special private fund furnishes the means of "healthful and invigorating" recreation. The appointment of at least one woman welfare worker in each national plant is now required, and many controlled factories are following suit. Excellent results are said to have followed from the activities of these supervisors. In August, 1916, this department was further empowered to make rules regarding arrangements for meals, supply of drinking water and protective clothing, ambulance and first-aid provision, supply and use of seats in workrooms, washing and locker facilities and supervision of workers.

Some attempts have also been made to relieve the housing situation in a few large munition centers, such as Sheffield and Woolwich, where the government has either financed or subsidized the building of houses and of temporary "huts" and hostels. Dr. Addison, of the Munitions Ministry, stated in August, 1916, that accommodations for 60,000 persons had been provided in the year previous and in some cases whole villages had been built.

Effort has been put forward by the government to protect munition workers from industrial poisoning. Sets of rules have been drawn up, regulating conditions of work in dangerous processes. For example, an elaborate code of rules was issued in February, 1917 for factories making or using T. N. T. (Cd. 8494). Among the protective measures required were the medical examination at least once a week of each worker employed on a T. N. T. process, the supplying of a half pint of milk gratis to each worker every morning, provision for protective clothing and for washing it at least once a week, and the required establishment of canteens at every T. N. T. factory on the principle that proper nourishment is essential for resistance to industrial disease.

In a general way, also, the work of the Health of Munition Workers Committee has improved industrial conditions. Public interest has been directed toward abuses, and a more intelligent attitude created in regard to sources of labor difficulties. The dissatisfaction of labor, however, has been by no means eliminated, despite the fact that the Munitions of War Amending Act, passed in January, 1916, remedied the worst evils of the leaving-certificate system and of the administration of the munition tribunals. The "dilution" of labor has progressed so far, and the attitude of both employers and the government has been such as to make the trade unions fear that after the war it will be well-nigh impossible for them to

restore their ante-bellum status. Plans to mobilize the whole population for national service, civil as well as military, on a scale more comprehensive than ever before, are being pushed forward with vigor by the Lloyd-George ministry, and to make this mobilization effective the club of industrial conscription is being held over the heads of the British people. In the face of the apparent weakening of their powers, however, the unions are claiming large gains in numbers and in strength, not alone among women, but also among men, despite the heavy inroads which the call to the colors has made in their membership.

The most immediate problem facing British labor at present, however, is the question of wages. The cost of living is soaring and wages in many cases have not kept pace, notably among women. The Munitions of War Amending Act of January, 1916, authorized the Minister of Munitions to enforce minimum wages for munition workers, but no action was taken which affected the large body of women until July, 1916, when a wage order* was issued which was designed to do away with the sweating of women. This order has aroused considerable antagonism in labor circles because its minimum rate becomes in effect the maximum. The rate is fixed at 4½d. an hour for women of eighteen years or more employed at work customarily done by women. Women who have replaced skilled men (a small proportion of

* This is Statutory Order No. 447.

those employed on munition work) are paid at the same piece-work prices as men, although, according to a prominent trade union man, because they cannot turn out as much work, their earnings are only about 75 per cent of what men make. The wage for women who have replaced semi-skilled or unskilled men was fixed according to an order issued in May, 1916, at a time rate of one pound a week. An improvement in the earnings of women in this class of work was effected the following December by an amendment providing for the payment of a one-pound wage for a forty-eight-hour week, with six pence as the hourly rate for all work in excess of this period. A pound now has no more purchasing power than 12 shillings had before the war, and that sum had been commonly recognized as a sweated rate for women in industry. In January, 1917, previous wage orders were extended to cover women in subsidiary trades engaged in munition making, where hitherto women's wages had been so low as to call forth a campaign of criticism. March and April, 1917 saw substantial wage increases for men chiefly in the engineering branches of the munition industry and the promise of corresponding increases for women workers.

Difficulties are being somewhat overcome, however, partly through concerted effort and partly through a natural readjustment to what, it is now apparent, will be a prolonged struggle. Due credit

should be given to the English government for its great achievement in industrial organization during the past year and a half, and for its recognition of the importance of the human element in efficiency of production; but there is still need to remember that in a long race it is endurance, not sprinting, that wins.

MUNITION WORKERS IN FRANCE

AS DESCRIBED BY A BRITISH COMMISSION

FRANCE had been far more successful than England in increasing her output of munitions during the first year of the war. In spite of the fact that one-eighth of the country and five-eighths of the former "metallurgical productivity" were in the hands of the enemy, her manufactures had been enormous. The response to her call for workers had been both more enthusiastic and more immediate than England's.

It was, therefore, natural that the British government should turn to her ally for guidance, and in November, 1915 the Director-General of Recruiting for Munitions Work in England appointed a commission of four members* to visit the industrial districts in France and report upon the causes which had contributed to the enormous increase in the production of munitions in that country. The commission visited 23 factories in different centers of the industry. A month later, in December, 1915, it made its report† giving a

* J. T. Brownlie, Chairman of Amalgamated Society of Engineers and member of National Advisory Committee and the Central Munitions Labour Supply Committee; Alexander Duckham, Ministry of Munitions; D. J. Shackleton, Labour Adviser, Ministry of Munitions; Allan M. Smith, Secretary Engineering Employers' Federation and member Central Munitions Labour Supply Committee. Two engineers experienced in munition manufacture in Great Britain were attached to the Commission.

† Ministry of Munitions. Report by Mission Appointed by the Director-General of Recruiting for Munitions Work. Output of Munitions in France. London, 1916.

brief account of the conditions prevailing in these factories.

ORGANIZATION OF MUNITION INDUSTRY

One of the striking features of French organization they found to be the prevalence of the small producer. There were 1,800 of these in the Paris district alone. The work done in these small shops was let out on sub-contract by the large producer. The small French shops were often manned by the members of a single family who divided the work on their inadequate machinery into day and night shifts. Despite the many handicaps their production was surprisingly satisfactory, but from stories told it was apparent that serious overwork, due to a spirit of self-sacrifice, occurred frequently in these small establishments. One woman, whose husband was at the front, literally worked herself to death in superintending his shop, and he was then recalled from the army to take her place.

Another feature of factory organization was the high degree of specialization in product in each plant, which resulted in an increase of repetitive work involving less need for skill, greater speed, and decrease in the amount of tool room and inspection work required.

Apparently the English system of government and "controlled" factories had not been adopted. New factories had been erected, old ones extended, and others adapted to the manufacture of munitions, but in spite of the remarkable increase in

number of plants none had received either a subsidy or a loan from the government.

The Commission gave high praise to the well-planned layout of the new and remodeled shops in avoiding congestion and in providing extra facilities for the transport of material, as well as to the initiative and energy displayed by French manufacturers in importing large quantities of new machinery.

INDUSTRIAL RELATIONS

In the munition factories a large proportion of the male labor is military, many of the men being those who are not physically fit for active service, but who are still mobilized and under military law. Any attempt in England to employ soldiers in munition plants under military law has met active opposition by the trade unions, who considered it nothing less than industrial compulsion. But France had had no counterpart of England's difficulties with trade unionism. There had been no strikes, no demands for general wage increases or for the limitation of employers' profits, no opposition to the "dilution" of labor or to the suspension of union rules of hours and wages. This lack of friction may in part be due to the fact that a large number of the workers are subject to military discipline. The Commission were inclined to impute it, however, to the intense patriotism of the French.

Subsequent to the visit of the British Mission to France, however, several strikes occurred in

the Paris district, arising out of a demand for increased wages. As a result of these disturbances, in January, 1917, strikes were prohibited and a system of compulsory arbitration established.

HOURS OF WORK

The same general schedule of hours for munition plants prevailed in France as in England—that is, the more common double shift of twelve hours as well as the three eight-hour shifts. However, because of an absence of overtime beyond the regular schedule and because of a long break at noontime, customary in the working day in France, which averages an hour and a half and is sometimes two hours, there was at least no marked evidence of fatigue. The intensity of production and the almost entire absence of lost time were the two tests by which this conclusion in regard to fatigue was reached. In addition to the fact that overtime was not worked, the change from day to night shift, or vice versa, which is made every two weeks, gave the workers twenty-four hours off.

The customary starting hour for the day shift was 6 or 7 a.m. Ten to twelve hours are worked on this shift, and nine and a half to eleven on the night shift.* The night shift began at 6, 7 or 8 p.m., and ran through to 5, 6 or 7 a.m., according to the time of starting. The rest period at night was often shorter than in the daytime, being

* The mean hours on day shift are 10 hours, 45 minutes, and on night shift 10 hours, 10 minutes.

usually one hour, and sometimes, though rarely, as short as half an hour, in which case the time was paid for and the machines were not stopped. It was claimed that night production equalled and sometimes excelled that on the day shifts. Where the three-shift plan has been adopted, there is no break whatsoever for meals during the long eight-hour spell, but "in some cases light refreshment is taken while the work proceeds."

Two schedules for the triple shift were found in use. According to the first schedule the first shift ran from 6 a.m. to 2 p.m., the second from 2 to 10 p.m. and the third from 10 p.m. to 6 a.m. On the other schedule the shifts ran from 4 a.m. to 12 noon, from 1 p.m. to 9 p.m. and from 8:45 p.m. to 4:15 a.m. Saturday hours on double and triple shift systems were the same as those on other days, but in some cases work stopped at noon on Sunday.

Sunday Work: No statement was made as to the prevalence of Sunday labor, but by implication the impression was conveyed that at least part of Sunday is commonly a working day. The change from day to night shift, however, gives a twenty-four hour rest period every other week.

Lost Time: Lost time is dealt with severely when it is due to avoidable causes, and this may account for the strikingly small amount which occurs. A first offense on the part of a civilian brings a reprimand, a second sometimes a fine, but more often dismissal. Military workers are dealt with under military law.

WAGES

The question of wages, which did not come within the jurisdiction of the Newman Committee, was dealt with in the report of the Commission to France. Piece rates were paid for almost every type of work, and women received the same rate as men. During their period of training, however, workers were paid a time rate, usually the guaranteed minimum. The premium bonus system was not in use anywhere. Some average daily earnings are given in Appendix C of the report. For men, the averages* ranged from 6.01 francs per day for laborers to 10.42 francs for machine men and 12.23 francs for skilled workers. For women, the minimum was 3.53 francs and the mean 5.95. These earnings, while low compared with American wages, seem to be somewhat in excess of wages paid in France before the war† for work of a similar nature, although the Commission itself makes no comparison. But food prices and the cost of living generally have advanced so much

* These averages are averages of the mean earnings per shop and are not weighted according to the number of employes per shop.

† In 1911, in a report published by the French Minister of Labor on wages and cost of living, the mean daily earnings for day laborers was 5 francs in Paris and 3.26 francs in other cities; for metal workers 8.25 francs in Paris and 5.39 in other cities; for iron founders 10 francs in Paris and 5.12 in other cities. In women's occupations, such as millinery, the mean daily earnings were 5 francs in Paris and 2.48 in other cities; for dressmakers 3.50 francs in Paris and 2.28 in other cities.—Ministère du travail et de la prèvoyance sociale. Salaires et coût de l'existence à diverses époques. Paris, 1911. pp. 22-23.

that the slight increase in wages does not in any way compensate for the added drain on expenditures. January, 1917, however, brought the establishment, by the French Minister of Munitions, of a basic minimum hourly rate for women of .65 francs, equivalent to six pence, a standard for which English women workers have thus far struggled in vain. For men the basic minimum rate was fixed at .80 francs an hour. The average minimum hourly earnings for piecework were not to fall below one franc for men or .75 francs for women according to this order.

THE WOMEN WORKERS

The employment of women, of course, receives special consideration in any discussion of war work. As in England, French women have been drawn into the munition industry from all employments and from non-industrial life. An interesting table is presented in Appendix B of the report, showing the former occupations of women employed in one large plant and the processes of work on which they are at present engaged. Housewives, domestic servants, artists, hairdressers, clerks, florists, dressmakers, typists, weavers, milliners, school teachers, lace makers, those "of no profession," and many others are listed. Housewives formed over 20 per cent of the women employed, and in several departments actually constituted the predominant group.

The work done by women covered practically all processes. At the time of the visit of the Com-

mission they were beginning to be employed even at some parts of setting up and tool making, including the grinding of tool edges. It was thought by some of the members of the Commission, however, that some of the work done would be considered in England to involve too severe a strain. Women's output on "small work" equalled and in some cases even exceeded that of men, while on the heavy work, for the most part, their productive power was of practically equal value. Their hours of work were substantially the same, except that there was a tendency to employ but few women at night, which had under the double-shift plan resulted practically in a day shift for women and a night shift for men. Under the three-shift system, however, women were employed at night, and the tendency was toward their more frequent employment at night on the double shift as well. An effort to overcome the fatigue from congested transit was shown by the custom of permitting women who were obliged to ride to and from work to begin fifteen minutes later than men, and leave fifteen minutes earlier.

For the most part, good sanitary conditions were found in the French shops, as well as adequate washing and locker facilities. Several factories supplied caps and overalls for women. No other provision, however, against exposure to industrial poisons or accident, nor for medical service within the factories was mentioned. Some firms had woman superintendents of discipline, in addition to forewomen, but employers were

divided in opinion as to the desirability of such a plan.

TECHNICAL INSTRUCTION OF WORKERS

No provision had been made by the French government for the technical instruction of unskilled men and women, and the necessary training was given therefore in each factory. The average period of training for women on machines was a week, though it ranged from less than one day to a fortnight. A man often taught a woman who then took his place, taught another woman, and then was replaced as a teacher by her pupil.

CAUSE OF INCREASED PRODUCTION

The Commission gave the highest praise to both employers and workers. They believed that the patriotic spirit on both sides was responsible for the good timekeeping of workers, for freedom from trade union restrictions, and for increased intensity of production. Employers had stopped at nothing to get the most adequate equipment. While, as has been stated, no official limit had been put on profits, as in England, neither had there been any demand for it made by workers. This freedom from restraint and the greater incentive for gain may have reacted favorably on the output of munitions.* Though several incidental factors were mentioned as in part responsible for

* A recent newspaper item, however, states that a committee of the French Senate have brought charges against French munition manufacturers of graft and excessive profits made on government contracts.

the enormous manufacture of war materials, the success was attributed almost wholly to the splendid spirit of devotion to the French cause shown by workers and employers. The final conclusion of the report, despite the presence of a trade union member on the Commission, makes by implication a thrust at English labor. It states that "the people of France realize that they are at war, that their one idea . . . is to bring the war to a successful issue," and that, furthermore, the increase of production is due to one cause, and one only, and that is—patriotic enthusiasm.

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